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Russia's Military Doctrine: In Light of the New Realities

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[Unattributed article]

[Text] The sum total of the numerous, hard-to-predict situations determining the current military-political and military-strategic situation in the world have required the leadership of the main states of the world, including Russia, to reexamine military doctrines, strategic concepts, and views toward military organizational development and employment of the armed forces.

On 2 November 1993, by Decree No. 1833 of Russian Federation President and Security Council Chairman B.N. Yeltsin, a most important document for our armed forces was approved: "Basic Provisions of the Military Doctrine of the Russian Federation."

With the creation of the Russian Armed Forces in May 1992, our country was faced with the task of forming the fundamentals of organizing them and elaborating a national military doctrine. It was necessary not only to update existing military-doctrinal views but also to work out fundamentally new directions of military policy. The need for this is explained by the influence of a whole series of factors.

First, the system and nature of international relations and the geopolitical situation in the world changed radically in the early 1990's.

Above all, this was linked to the breakup of the Soviet Union and Warsaw Treaty Organization. The ending of confrontation that had taken place under the banner of the struggle between the two systems and influenced all aspects of international affairs not only moved away the threat of global war but also laid the prerequisites for new, constructive cooperation of countries on regional and global levels in the United Nations and other international organizations. Although the concept of "nuclear deterrence" and the military force factor continue to play a weighty role in the world, there is a clear trend toward formation of an international community regulated on the basis of rules of international law. In these conditions, a foundation is being laid for fundamentally new relations between the Russian Federation and the surrounding world.

The relations taking shape do not preclude differences and contradictions which sometimes take on acute forms, which is explained by the specific nature of historical, geopolitical, economic, and other interests. However, in our view, they must be regulated within the framework of normal interaction of states.

A particular feature of the world today has become the formation of political centrism in world policy. Instead of two superpowers heading the corresponding opposing

coalitions, given the dominating position of the United States today, new centers of power are being established in the person of individual states and communities (China, Japan, Russia, a unified Germany, and other West European countries). They are able to actively defend their interests and expand their influence on solving world problems.

A further differentiation of Third World countries is taking place. Some, having achieved certain success in economic development and having created the fundamentals of a national military industry, have already become or are becoming centers of power in their regions. At the same time, socio-economic, national-ethnic, and other problems are worsening in the majority of these countries.

Second, in individual regions there is still a fairly high level of tension, caused by the different orientation of the political guidelines of countries. This is caused by the difference in their national interests, the incompleteness of the processes of formation of the new sovereign states, differences in their population's standard and quality of living, and social and economic inequality.

The situation is characterized by an increased danger of local wars and also armed conflicts within individual states on grounds of national-ethnic, territorial, religious, and other contradictions. The growth of aggressive nationalism is especially dangerous. This, unfortunately, applies fully to a number of states formed on the territory of the former USSR. Economic crisis, the socio-political heterogeneity of the republics, mutual territorial claims, and national-ethnic and religious strife are leading to the fact that the countries closest to the Russian Federation are becoming one of the primary sources of a threat to its security.

The situation is also complicated by the desire of a number of Third World countries to use this situation in their own interests. To a considerable extent this is helped by the attempts of certain former republics of the USSR to play the American, NATO, German, Romanian, Turkish, or other card against Russia. The increase in foreign influence in countries of the near abroad may help to weaken the positions of the Russian Federation and infringe upon its vital interests.

Third, elaboration of our state's military doctrine depends directly on the internal political and economic situation and new views on foreign and domestic policy. This factor has the following basic aspects.

—Our country's political leadership's adoption of a thesis that Russia today does not regard any state as its enemy has made it necessary to form new approaches to the entire spectrum of problems of military organizational development.

—In working out doctrinal tenets and determining the tasks of the armed forces and their future appearance,

one should take into account today's extremely limited economic and financial capabilities of our state and proceed from its real capabilities.

- The process of comprehensive interpretation and official consolidation of Russia's state priorities and its vital interests that is taking place cannot help but be reflected in the elaboration of the concept of security of the Russian Federation.
- It is necessary to bear in mind that besides external threats to Russia's security, threats of an internal nature have begun to manifest themselves increasingly clearly in recent years.
- The laws being passed in the country have a great influence on the formation of doctrinal tenets. Thus, the Russian Federation Law on Defense singles out Border Guards, Internal Troops, Civil Defense Troops, Railroad Troops, and others from the armed forces. This has resulted in the need for the new doctrine to reflect a number of specific tasks entrusted to them both during peacetime and wartime. Determining the maximum numerical strength of the armed forces, adopting a broad list of deferments from military service, and so forth are of great importance for organizational development of the armed forces.
- The range of tasks to be accomplished by the armed forces is constantly expanding. Above all, this is associated with fulfillment of Russia's international obligations for participating in peacekeeping operations under the aegis of the United Nations and other bodies of collective security.

What does the essence of the "military doctrine" concept involve and how does it influence formation of a state's military policy?

Military doctrine is a system of views adopted in a given state toward the objectives and nature of a possible war, preparation of the country and armed forces for it, and also the methods of waging it.

Not all countries have a military doctrine formalized as a separate document. For example, in the terminology adopted in the United States, there is no definition identical to the "military doctrine" concept used in Russian military science. However, the system of views objectively existing in the United States, as in any other state, toward the essence, objectives, and nature of a possible war, preparation of the country for it, and methods of waging is expressed in such categories as "national security," "national security strategy," "national military strategy," "strategic concepts," and so forth.

The basic tenets of military doctrine are caused by the socio-political and economic system, the level of development of the means of waging war, and the specific country's geographic situation.

In examining the tenets of the Russian Federation's military doctrine, let us draw some parallels with the doctrines of leading foreign states and also acquaint readers with the preliminary reaction to it abroad.

To start with, let us turn attention to the definition of the Russian Federation's military doctrine, which differs somewhat from what we dwelled on above.

The Basic Provisions of the Military Doctrine of the Russian Federation are a set of officially adopted views in the state toward preventing wars and armed conflicts, military organizational development, preparing the country for defense, organizing opposition to threats to the state's military security, and using the armed forces and other troops of the Russian Federation to protect Russia's vital interests. This definition emphasizes the defensive orientation of our state's military policy and the priority of political and diplomatic methods of resolving disputes.

Russia's military doctrine is based on a new, all-embracing concept of the country's security and is a component part of the Concept of National Security of the Russian Federation. The provisions of the Russian Federation Law on Security define the country's interests and real and potential threats, both external and internal. The doctrine encompasses problems of using not only the armed forces but also other troops to safeguard the country's security. As the experience of all conflicts shows, various forces and assets can successfully accomplish their tasks only in close cooperation. The military doctrine is based on the state's real political, economic, and military capabilities. A fundamental characteristic is the fact that military organizational development in Russia is being accomplished in conditions of a transition to a market economy, when the role of the Ministry of Defense in forming and implementing military-technical policy is radically changing.

Traditionally, military doctrine has two aspects—political and strictly military (or military-technical); however, this document has three interrelated parts: political, military and military-technical, and economic.

Singling out the military-technical and economic fundamentals is caused by the complex transition to a market economy, which is leaving a serious mark upon the entire process of organizational development of the armed forces. Today we should talk about the fact that complete and qualitative material and technical support of the army is not only determined by guaranteed order at state enterprises, as it was earlier, but depends to a considerable extent on setting up cooperation between the Ministry of Defense and so-called "private firms" on a contract basis.

The political fundamentals of the military doctrine reflect the attitude of the Russian Federation towards armed conflicts and use of the armed forces and other troops and determine the main sources of war danger, political principles, and basic directions of social and political

safeguarding of the security of the Russian Federation. They formulate the state's tasks in the area of military policy.

Here it points out for the first time that the Russian Federation does not regard any state as its potential enemy. This provision has been met in the West with understanding.

Compared to the previous doctrinal guidelines, considerable differences have appeared in the political assessment of the presence of nuclear weapons in the leading countries of the world, including Russia itself, and the views on their use. Thus, the thesis on the non-use of nuclear weapons first by Russia has been eliminated. It was namely this provision to which the leadership of a number of leading foreign countries directed attention.

Such countries as Great Britain and Germany believe that the Russian leadership's views on using nuclear weapons as a deterrent factor in unleashing war against Russia and its allies, despite their rigidity, correspond to a certain degree to the views of western nuclear powers. From a political standpoint, this puts the Russian Federation in a position equal with them. The United States takes a similar position with respect to this point of our military doctrine. The People's Republic of China remains the only country still having a commitment not to use nuclear weapons first.

At the same time, the thesis cited in the doctrine about the possibility of Russia using nuclear weapons against non-nuclear countries, should they engage in war against Russia or its allies on the side of nuclear powers, has been met with great caution abroad. For example, Italy, Belgium, and Romania see this as a veiled threat to both NATO (if the bloc interferes in conflict situations in the CIS) and East European countries (in the event of their participation in military operations against Russia on the side of states possessing nuclear weapons).

In the Chinese leadership's opinion, inclusion of this thesis in the doctrine supposedly indicates Russia's desire to achieve its foreign policy goals by relying on the principle of "nuclear deterrence."

A number of American experts believe that our doctrine also serves as a warning to Turkey (although it does not have its own nuclear weapons) against interfering in the war between Armenia and Azerbaijan. The Turkish leadership perceived this provision fairly guardedly, since it sees it as a threat to its interests in the Transcaucasus and Central Asia.

At the same time, Washington regards Russia's nuclear policy as a kind of appeal to Ukraine to follow the spirit and letter of the Nuclear Weapons Nonproliferation Treaty. It should be noted that the treaty expires in 1995, and Russia is interested not only in strict observance of the treaty but also in giving it a permanent status.

According to the new doctrine, the primary goal of using the Armed Forces of the Russian Federation in armed

conflicts and local wars is to localize hotbeds of tension and put a stop to military operations in the early stage in the interests of settling the conflict by political and diplomatic means on terms corresponding to Russia's interests.

The military policy also contains new tasks put before the Russian Armed Forces by today's conditions.

—By decision of the UN Security Council and other bodies of collective security, conducting peacemaking operations, above all within the framework of the CIS. The conditions and forms of Russia's participation in international peacemaking actions and the procedure for their cooperation with contingents of other countries are determined by the UN Charter, international agreements, and legislation of the Russian Federation.

—Providing assistance to internal affairs bodies and the Internal Troops in localizing and putting a stop to various conflicts and other operations using means of armed violence within the Russian Federation that are threatening its constitutional system, territorial integrity, and other vital interests of the society and Russian citizens. This does not at all mean assigning the armed forces functions of the Internal Troops, but provides for the opportunity to assist them when necessary to normalize the situation and create conditions when settling conflicts by political means.

This provision evoked different reactions in the West. Many analysts believe that officially giving the Armed Forces of the Russian Federation internal functions is the legal consolidation of an already existing situation. But Great Britain and Italy, where in the last 20 years the participation of regular armed forces in settling internal conflicts and fighting organized crime was considered an objective necessity, perceived this provision of our doctrine with understanding. These countries have become convinced in practice of the justification of maintaining law and order and putting a stop to bloodshed using the armed forces.

The document clearly defines the state's tasks for safeguarding security in peacetime, during the threatening period, and with the start of war.

In peacetime they come down primarily to preparing the infrastructure and armed forces to repel possible aggression.

The state must maintain a defense potential at a level identical to existing and potential military threats. It should also take into account the condition of its economy and availability of the necessary human resources, qualitative improvement of the armed forces and other troops, and ensuring their combat and mobilization readiness guaranteeing the country's military security.

It notes the need for priority allocation of appropriations for defense, scientific, and technological developments

most promising for safeguarding the security and development of the economy of the Russian Federation, and also for rational conversion of military production. This aspect is one of the most important in the situation that has taken shape today.

During the threatening period and with the start of war (armed conflict), bodies of state administration are tasked for the timely declaration of war, imposition of a state of emergency or martial law in the country or in individual localities with the simultaneous bringing of the armed forces and other troops to the necessary degree of combat readiness, and issuing orders for the preparation and execution of specific operations.

The state must mobilize the necessary forces and assets for waging political, economic, armed, and other types of warfare to prevent aggression, repel an attack, and defeat the enemy. The efforts of all bodies of power and administration, public organizations, and the population must be coordinated in order to inflict such damage on the enemy that would force him to abandon further combat operations on terms corresponding to the interests of the Russian Federation.

In the area of international relations, the state ensures fulfillment of Russia's obligations concerning providing military assistance to allied countries, participation in peacekeeping operations, and also operations of the UN Security Council and other international organizations for maintaining and restoring peace and security at as early as possible stage of development of a threatening situation or conflict.

Existing and potential sources of war danger for the Russian Federation are defined in the political fundamentals of the military doctrine:

- territorial claims of other states against the Russian Federation and its allies;
- existing and potential hotbeds of local wars and armed conflicts, above all in direct proximity to Russian borders;
- the possibility of using (including unauthorized use) nuclear and other types of weapons of mass destruction that are in the inventory of a number of states;
- proliferation of nuclear and other types of weapons of mass destruction, delivery vehicles for them, and the latest technologies of military production combined with attempts by individual countries, organizations, and terrorist groups to realize their military and political aspirations;
- the possibility of undermining strategic stability as a result of violating international agreements in the area of arms limitations and reductions, and qualitative and quantitative build-up of arms by other countries;
- attempts to interfere in internal affairs and destabilize the internal political situation in the Russian Federation;

- suppression of the rights, freedoms, and legitimate interests of citizens of the Russian Federation in foreign states;
- attacks on military installations of the Armed Forces of the Russian Federation located on the territory of foreign states;
- expansion of military blocs and alliances to the detriment of the military security interests of the Russian Federation;
- international terrorism.

The main factors contributing to the development of war danger into a direct military threat to the Russian Federation are:

- buildup of troop (force) groupings near the borders of the Russian Federation to limits disrupting the correlation of forces that has been established;
- attacks on installations and structures at the state border of the Russian Federation and borders of its allies, and unleashing of border conflicts and armed provocations;
- training on the territory of other states armed formations and groups intended to be transferred to the territory of the Russian Federation and its allies;
- actions by other countries to impede the functioning of Russian systems for support of strategic nuclear forces and state and military command and control, above all their space component;
- introduction of foreign troops on the territory of states adjacent to the Russian Federation, unless this is associated with measures to restore or maintain peace in accordance with a decision of the UN Security Council or regional collective security body with consent of the Russian Federation.

In addition, the increase in the degree of threats to the Russian Federation's military security is promoted by the unofficial nature, in a treaty respect, of a number of sections of the state border of the Russian Federation and the incompleteness of settling the legal status of the stay of the Armed Forces and other troops of the Russian Federation outside its borders.

Principles of organizational development and employment of the armed forces and other troops, their missions, and questions of organizing command and control of them are examined in the military fundamentals of the doctrine.

The military portion of the doctrine itself is the basis of military organizational development of Russia as a whole, strategic planning of employment of the armed forces, and organizing their coordination with other troops in the interests of safeguarding the security of the Russian Federation.

In elaborating the military fundamentals of the doctrine, the leadership of the Russian Federation proceeded from the fact that the probability of a world nuclear or conventional war being unleashed has decreased today and for the foreseeable future. However, the danger of armed conflicts and local and regional wars breaking out not only remains but is increasing. This is fully confirmed by the events in Nagornyy Karabakh, South Ossetia, the Dniester Region, Abkhazia, Tajikistan, and other "hot spots." Similar views are held by the military-political leadership of the United States and other NATO countries.

With respect to large-scale wars, the Russian Federation's military doctrine notes the need to prepare the armed forces for conducting both defensive and offensive operations in conditions of massive use of modern and advanced weapons under any variant of unleashing and waging war. The doctrine departs from absolutization of any one type and method of conducting military operations. It orients command personnel and staff the fact that during the course of repelling aggression, namely those forms, methods, and means of armed struggle are selected which correspond to its laws and the developing situation.

Creating mobile large units and units capable of being transferred to certain areas in a short period of time is considered one of the priority directions of organizational development of the armed forces. They are intended for reinforcing peacetime troop dispositions in strategic areas (in theaters of military operations) and accomplishing together with them missions in local (regional) conflicts and also for supporting the deployment of reserves of the Supreme High Command.

This concept coincides with the views of the U.S. administration, devoting considerable attention to the organizational development of "rapid deployment forces," and of the NATO leadership, implementing a program of creating a new three-component structure of the NATO armed forces. The latter will include "reaction forces" ("immediate reaction forces" and "rapid deployment forces"), the main defensive forces, and reinforcements. Organizational development of the People's Liberation Army of China and the armed forces of a number of other states of the world is being conducted in a similar direction.

A new aspect is the provision that in the interests of the security of the Russian Federation and other CIS members, troops (forces) and assets of the Russian Federation may be stationed outside its territory, including as part of joint forces.

It should be noted that this provision of the doctrine met a generally negative reaction in the West. They believe that this may serve as a formal basis for Russia's military intervention in the internal affairs of sovereign states under the pretext of protecting its interests and the rights of Russian citizens. However, concepts of the NATO

coalition military strategy such as "forward defense" and "reduced military presence" differ little from our position on this question.

Provisions on defining the types of wars and the basic principles of organizational development of the armed forces merit special attention in the military fundamentals of the new doctrine.

The following types of war are singled out in the military doctrine:

- world or large-scale (conventional or nuclear);
- local (with the use of conventional or nuclear weapons);
- armed conflict, which can be internal or external, depending on the existing and potential threats to the security of the Russian Federation.

It must be noted that despite the decrease in the threat of a world war, the likelihood of its outbreak is not completely excluded by the military doctrine. Such a war can begin in the event the international situation worsens sharply as a result of the use of weapons of mass destruction by one of the sides in a local war or armed conflict, an accidental launch of nuclear missiles, or also due to the unsanctioned use of other weapons of mass destruction.

Local wars and armed conflicts are considered the main danger in this stage. The same approach to defining the types of wars is characteristic for military doctrines of NATO and such leading foreign countries as the United States, Japan, and China. In this case, there is actually only a terminology difference.

The United States calls for a concentration of main efforts in military organizational development as it applies not to the European Theater of War (as was the case before), but to other regions of the world (above all, the Middle East, Southwest and Northeast Asia, and also certain other areas of existing and potential instability). These radical changes are based on consideration of the decrease in the likelihood of a large-scale conflict in Europe and continued tension in a number of regions and proliferation of weapons of mass destruction and missile technologies.

From the viewpoint of American military experts, the main thing in strategy is orientation on limited (local) wars in different regions of the world. A characteristic feature of such wars is that peacemaking forces can be used in the majority of them under the aegis of the UN.

The section "Military Fundamentals of the Military Doctrine" singles out the following provisions on the basic goals, principles, and tasks of organizational development of the Armed Forces and other troops of the Russian Federation:

- the control by bodies of military command and control and officials of higher bodies of state power—the government of the Russian Federation;

- observance of general civil political rights and freedoms and social protection of servicemen in accordance with the specific nature of their service;
- centralization of military leadership and one-man command on a legal basis;
- conformity of the organizational structure, force composition, and numerical strength to the tasks entrusted to them, legislation, international obligations, and economic capabilities of the Russian Federation;
- ensuring a high level of professionalism of the Armed Forces and other troops of the Russian Federation;
- creating conditions for building up the combat might of the Armed Forces and other troops of the Russian Federation identical to the increase in military threat, and pre-positioning and training of a mobilization reserve;
- consideration of the country's geopolitical and geostrategic position;
- using domestic and world experience of military organizational development.

It should be noted that certain provisions of the military fundamentals of our doctrine are perceived negatively by countries of the West. In particular, they note an overstatement of the level of military danger and the possibility of large-scale aggression against the Russian Federation. It is believed that such an assessment allegedly does not fully take into account the changes that have taken place in the world and the efforts being undertaken by NATO to reorganize and reduce their armed forces. This, in turn, has led to making unjustifiably high, in the opinion of foreign analysts, demands on the level of combat readiness of the Armed Forces of the Russian Federation during peacetime and orienting them towards conducting not only defensive but also offensive military operations.

The priorities of **military-technical support** of the Russian Federation's military security have been determined:

- further development of fundamental and applied research and experimental design developments making it possible to respond effectively to military threats arising and military-technical breakthroughs;
- development and production of various highly efficient command and control, weapon guidance, communications, reconnaissance, strategic warning, electronic warfare, and high-precision mobile non-nuclear weapon systems, as well as information support systems for them;
- maintaining the entire strategic arms complex at a level ensuring the security of the Russian Federation and its allies, strategic stability, deterrence of nuclear and conventional wars, and also nuclear security;

- increasing the individual level of technical equipping of service members with means of conducting armed warfare, communications, and protection;
- improving the ergonomic characteristics of armament and military equipment in "soldier-machine" systems.

Development of the defense industry potential must be accomplished along the following directions:

- ensuring a level of fundamental, exploring, and applied research, advanced scientific-technical and technological developments and development of an scientific-experimental, test, and production base for enterprises (organizations) guaranteeing fulfillment of the state defense order;
- rational, balanced development of a defense industry potential and its infrastructure ensuring the country's military security, implementation of a program of conversion of military production, and efficient functioning of the economy as a whole;
- creation and development of capacities for the production and repair of armament, military and special equipment and gear necessary for the complete cycle of production of their main types;
- development and implementation of a set of measures for mobilization readiness of the economy and creation of state mobilization stockpiles.

The Basic Provisions of the Military Doctrine as a component part of the Concept of National Security of the Russian Federation determine the ways and means of safeguarding the country's security in the transitional stage of its development. As Russian statehood develops and a new system of international relations is formed, the Russian Federation's military doctrine will be supplemented, updated, and improved.

Baltic Region in U.S. Plans

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[Article by Maj-Gen A. Meshkov and Col A. Nikolayev]

[Text] The integration processes in Europe, which have a great influence on creation of an effective system of European security, have entered a new phase. They affect the interests of virtually all countries, those opposing one another and also those traditionally neutral. Development of events, especially around Yugoslavia, revealed the limited capability of NATO to react adequately to crises and quickly counter the development of instability in individual states or regions into an international conflict along the lines of "East-West" or "North-South." In this regard, the military-political course of the majority of West European countries is already now aimed at strengthening their independence

in resolving problems of regional security. Further development of relations between them in the areas of implementing military-political organizational development within the framework of the European Union [EU] and the West European Union [WEU] and also in questions of a gradual political distancing from the United States is acquiring paramount importance.

This approach, in the opinion of western experts, will enable the leadership of West European countries, above all France and the FRG, to ensure a direct influence on the formation of security policy in Europe and to create an effective mechanism of monitoring and influencing development of the situation in the region.

Practical implementation of the Maastricht Accords attests to the reality of such plans. In particular, in the military area, despite the existing difficulties of the economic plan, a so-called "European defense"¹ (bodies of military-political administration of the WEU, a "Eurocorps", and so forth) is being created within the planned time periods.

Today, experts are studying the prospects of creating on the base of French and English nuclear arms an "intra-European system of nuclear deterrence." Its presence would substantially expand the capabilities of the European Community countries for using a multinational military formation (in the future a "Euro-army") to influence the course of European processes.

A redistribution of traditional "spheres of influence" in Europe between the European Community and the United States may soon become a result of this policy. Understanding the inevitability of such a process, the American administration is trying to oppose it in every way. However, the experience of the last two decades graphically demonstrates that the traditional form of American pressure of force—the use of or threat to use military force as a method of consolidating one's presence—has time and space limits. Exceeding them, as a rule, makes the situation difficult to predict or even unpredictable.

In this regard, the American leadership's attempt to use another approach to preserving the U.S. position on the European continent is quite logical. Its basis may be the "buffer idea," the essence of which is the creation (with the dominant influence of the United States) of zones of integration activity in geographically limited regions of Europe. The goal of such actions, on the one hand, will be to fill the "vacuum of influence" that formed after the breakup of the USSR and Warsaw Treaty Organization and, on the other, to create the prerequisites for intensifying possible American military intervention if crisis situations worsen.

An important role in these plans is allotted to the Baltic region. Today, the American administration, citing the traditional nature of support there of the nationalistic movement, is expanding cooperation with the Baltic

countries. It is believed that being a sufficiently developed part of the former USSR in the economic context and, on the whole, taking an anti-Russian stand, with considerable foreign investments the Baltic republics can accomplish a "harmonious, planned transition to a western system of security" according to the scenario and under the control of the United States.² Already now they are using the institution of American advisers that actively influences all spheres of activity of these states. Thus, in the area of national security and defense, they number as high as 50 people.

The top-priority tasks of the United States in the current stage are to achieve total independence of the Baltic republics from Russia, help speed up the withdrawal of Russian troops from Latvia and Estonia, and also intensify military cooperation with all countries of the Baltic region. In this regard, it is noteworthy that the U.S. administration, without coordination with its allies, already in October 1993 had reached an understanding on conducting joint troop and command and staff exercises. It is expected that the first of them will be held no later than the spring of 1994.

The aspiration of the governments of the Baltic countries to form a military-political Baltic Union also corresponds to American interests. Its creation with U.S. participation is regarded as a method of achieving political independence of the Baltic republics from Russia and formation of a common system of their defense.

Regarding achievement of specific results in this area as prerequisites for Latvia, Lithuania, and Estonia to join the North Atlantic Treaty Organization, the U.S. leadership is prompting them to create an integrated airspace control system. The Baltic states' plans to link it with a similar system in operation in Sweden, which in the future may lead to the formation of a combined Baltic region airspace control system, do not run contrary to Washington's plans. In doing so, consideration is given to the fact that the Swedish leadership has withdrawn from positions of traditional armed neutrality and has adopted a doctrinal concept of "independent defense," calling for the possibility of integration of the country into some kind of security structure during peacetime.

The American administration does not rule out the fact that in a certain stage of implementing this project there will be a need to involve U.S. forces and assets, specifically E-3A airborne warning and control system [AWACS] aircraft, to ensure the required effectiveness of airspace control. The United States is already prepared to begin practical actions to implement these plans. One step in this direction may be the intensive development of airspace and the airfield network of the Baltic countries by American aircraft of this type. Realization of this idea will enable the United States to consolidate positions in the Baltic region and also to receive at its disposal a sufficient mechanism of influence on the development of the situation in the north of Europe outside of NATO's area of responsibility.

Western experts assess the protracted political crisis between Russia and the Baltic countries as the most likely confrontational situation in the region. In the event the situation worsens, mobile NATO forces and combined naval forces of the bloc may be deployed here. In subsequent stages of the crisis, it is possible there will be a buildup of the grouping by means of a maritime component of the "reaction forces" being created (100 or more ships, including up to 50 carrying cruise missiles). Further reinforcement with ships from the Polish Navy (up to 30 ships, including 10-12 guided-missile ships) is not ruled out.

Such a concentration of coalition naval power in a limited region may give events an irreversible nature and become a source for the outbreak of a military conflict. According to American experts, realization of the "buffer idea" in the Baltic region could fundamentally help to prevent or settle it. First, the United States is acquiring a dominant influence here due to the structure created in advance for supporting its military presence outside of NATO's area of responsibility. Second, the individual participation by the United States in settling a crisis simplifies procedures for working out and adopting decisions in the UN and NATO, which makes it possible to avoid the lengthy process of coordinating various approaches to conducting operations to establish peace, as is taking place in Yugoslavia.

In accordance with the above, in the event of worsening of the military-political situation in the region, NATO's role may be limited by political pressure on the sides in the conflict on the condition of preserving the right to a total blockade of the Baltic straits.

In the early stages of a conflict, the Americans plan to include U.S. Air Force E-3A AWACS aircraft in the forces of the Baltic region integrated airspace control system. A detachment of these aircraft are based permanently at Keflavik, Iceland. Such reinforcement not only will increase the effectiveness of airspace control but also will it possible to obtain on a real-time basis information about the surface situation in the interests of deploying in the Baltic Sea zone U.S. Navy task forces.

Subsequently, in the event of a threat of escalation of the crisis, the United States, in accordance with its commitments to the world community, deploys in the Baltic Sea one or several operational missile groups (if necessary, an amphibious detachment also) tasked to blockade the forces of the Baltic Fleet and also disrupt lines of communication.

On the whole, the Baltic region is becoming an arena of foreign policy activity of the United States. The main objective is to establish military-political control over a flanking area important for Europe. In addition, the task is to restrict Russia's area of influence to the limits of its own territory, precluding the possibility of Russian influence on the Baltic states.

Footnotes

1. For more detail, see: ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1993, No 9, pp 2-4.—Ed.
2. Confirmation of the reality of U.S. military-strategic plans with respect to the Baltic states is the appeal by the Lithuanian leadership (January 1994) to the General Secretary of NATO with a request to accept the Lithuanian Republic into NATO and sign with the latter the document "Partnership in the Name of Peace."—Ed.

Measures for Joint Defense by Persian Gulf Arab Countries

94UM0387C Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 2, 1994 (signed to press 7 Jan 94) p 12

[Article by Lt Col M. Stepanov]

[Text] The ministers of defense of the member-countries of the Council of Cooperation of Arab States of the Persian Gulf (CCASPG), who gathered in November 1993 in Abu Dhabi for the annual meeting, recommended to the leaders of their states to accept into service the integrated warning and notification system based on E-3A AWACS aircraft. This was stated by Sheik Ali Al Sabah, minister of defense of Kuwait, at the conclusion of the conference, in which leaders of the military departments of Saudi Arabia, Qatar, the UAE, Bahrain, and Oman also took part.

The warning and notification system of the CCASPG countries is called upon to monitor the airspace of the six Persian Gulf monarchies. For its deployment, they are to purchase three or four E-3A aircraft in addition to the five acquired by Saudi Arabia in the United States in the 1980's and operated jointly with the Americans. About \$5 billion will be required for their purchase.

It is planned that national air forces and also surface-to-air missile [SAM] units will operated in the complex with the general warning system. After the end of the Persian Gulf War, Saudi Arabia and Kuwait alone plan to spend \$2 billion for the purchase of Patriot SAM's in the United States to reinforce the ground air defense component. Saudi Arabia's Army will receive 861 of these missiles, and 210 will be delivered to Kuwait.

During the conference, the ministers of defense of the six countries ratified a document approved by the chiefs of general staff that calls for reorganizing the joint armed forces having the name "Shield of the Peninsula." Created in 1986 and stationed on the territory of Saudi Arabia, until the present the joint armed forces were a symbolic formation with a personnel strength of up to 10,000. They showed a low level of combat effectiveness in August 1990 when Iraq attacked Kuwait.

The plan for reorganizing the joint armed forces of the CCASPG, developed by military experts of Oman, calls for the headquarters of these forces to be located in Saudi

Arabia. Each of the six participating countries will place at the disposal of the command authorities of the joint armed forces additional contingents of armed forces in order to bring their numerical strength up to 100,000 in 15 years. Representatives of the armies of the CCASPG member-countries will alternately command the joint armed forces. It is planned to accomplish financing by means of a special budget, which will be managed by the general secretary of the council. As Sheik bin Ahmad Al Khalifa, minister of defense of Bahrain, stated in an interview in February 1994 in the newspaper AL-KHAYAT, all the preparatory work for creating a joint command is virtually complete, and the parties have already begun organizing the common armed forces.

Until recently, Oman's plan did not have the unanimous support of other participants. Thus, Kuwait, in a quest for guarantees of its own security, sought help outside the region and to this end signed agreements on joint defense with the United States, Great Britain, and France. These documents call for deliveries of arms to Kuwait, conduct of joint exercises, and in a number of cases pre-positioning of military equipment on the territory of the emirate.

Development and implementation of the plans for creating an integrated warning and notification system, as well as strengthening the "Shield of the Peninsula" joint armed forces are linked to the fact that the CCASPG member-countries still consider Iraq and Iran to be a real threat to their security.

Psychotronic Weapons: Myth or Reality?

SAUM0387D Moscow ZARUBEZHNOYE
VOYENNOYE OBOZRENIYE in Russian No 2, 1994
(signed to press 7 Jan 94) pp 17-19

[Article by Lt Col V. Pavlychev]

[Text] In July 1992, the program "Now It Can Be Told" was shown over channels of the American television company NBC. It was devoted to problems of studying the possibilities of using individuals possessing a powerful bio-field for military purposes. It was noted that about \$1 million is being spent annually on this work being accomplished by the U.S. Defense Intelligence Agency. People with extrasensory perception were used to detect enemy troop and armament concentration areas and also to search for hostages. A special program of the U.S. Navy was mentioned, with the code name Aquarius, during which "clairvoyants" supposedly helped "locate" Soviet submarines. It was also said that during the war with Iraq, attempts were made to use telepathists to worsen the health of Iraqi President Saddam Khusayn. In an official statement, the Pentagon denied this sensational information. However, lately such an exotic topic has been attracting more than just journalists.

Throughout the 1980's, abroad and above all in the United States, there was an increase in the activeness of

certain military and civilian scientists in studying problems of bioenergy* associated with so-called paranormal human capabilities. The division of research devoted to the study of paranormal phenomena has been given the name parapsychology. It examines methods of receiving and transmitting information without using the normal organs of sense and also mechanisms of man's influence on physical objects and phenomena without muscular efforts. The term psychotronics is widespread—the creation of various technical devices based on energy from a bio-field, that is, a specific physical field existing around a living organism. This is how the concept of psychotronic weapons, created based on using paranormal properties of the human organism, entered military terminology.

It should be noted that in the West these problems constantly attract the attention of a quite large group of enthusiasts claiming scientific priority in the study of paranormal phenomena. Popular magazines as well as a number of special periodicals, monographs, and survey works of a reference nature are devoting much attention to describing such phenomena. Seminars, conferences, and symposiums are being conducted, including at the international level.

At the same time, a large group of scientists, above all in the field of the human psyche, until recently have continued to take the stand of sharp non-acceptance of the results of such studies of paranormal phenomena (often denying the very possibility of their existence) not corresponding methodologically and by the world outlook to concepts accepted in modern science.

In the mid-1980's, a series of review articles examining a person's paranormal capabilities from positions of modern scientific knowledge appeared in foreign scientific journals. They reported, for example, that Professor W. Paeshcke (Stuttgart, FRG) used artificially generated fields to affect a person's energy potential, as a result of which in certain conditions that person proved himself to be an exceptional personality. A former NASA employee, Dr. A. Puharich, studied the effect of poisonous mushrooms on the possibility of transmitting information between people over great distances. Robert G. John and colleagues from Princeton University (USA), in summarizing the results of their experiments, tried to apply the laws of quantum mechanics when evaluating parapsychological phenomena. Dr. Z. Harwalick (USA) examined the mechanisms of interaction of the human organism with geological anomalies.

At the same time, numerous articles have appeared associated with studying the possibilities of using discoveries in the field of bioenergy, parapsychology in particular, for military purposes. Simultaneously, a number of scientific projects on this problem have received financial support, although small (about \$6 million), from the U.S. Department of Defense, which indicates the Pentagon's interest in this problem. In addition, the Defense Department has been conducting research under a

number of programs (for example, "Biological Information Transmission Systems Not Previously Studied"), the content of which and the results obtained were not published for the public at large.

In the United States, primarily Rand, Westinghouse, General Electric, Bell Telephone Company, the Military Research Center at Redstone, the U.S. Army Scientific Research Institute for the Behavioral and Social Sciences (city of Alexandria) deal with questions of parapsychology. The Stanford Scientific Research Institute, known for its ties to the Pentagon, is noted for being the most active. Scientific workers and specialists are studying and trying to master the following complex phenomena: extrasensory perception—perceiving the properties of objects, their condition, sounds, odors, and thoughts of people without contact with them and without using normal sensory organs; telepathy—the transfer of thoughts and the psychic state of a person over a distance; clairvoyance (foresight)—observing an object (target) located beyond visual contact; psychokinesis—affecting physical objects using the influence of thought, causing them to move or be destroyed; telekinesis—thought movement of a person whose body remains at a state of rest (such names as out-of-body movement and movement in a paranormal state).

Presently, one can single out four basic directions of military-applied research in the field of bio-energy.

First, elaboration of methods of intentionally influencing a person's psychic activities. The American press has reported that in the early 1980's, the U.S. Army conducted scientific work to create an "new age Army." They studied teaching soldiers meditation, developing their ability for extrasensory perception and magic, as well as for "neurolinguistic instruction" and hypnotism methods. According to THE NEW YORK TIMES this program was closed, and its main leaders are no longer serving in the armed forces. Nevertheless, work in this direction continues. The Department of the Army has allocated \$425,000 to the National Academy for preparing a report which would scientifically substantiate the possibility of creating "super-soldiers" on the basis of using various paranormal capabilities. The report, published in late 1988, was given the title "Developing Human Potential." It concluded that the majority of these unusual phenomena "are not backed by scientific data." However, in the opinion of the report's authors, some of the problems raised in it may be of interest to the Defense Department; therefore, additional appropriations will be required for conducting fundamental research.

The second direction includes an in-depth study of paranormal phenomena that are of greatest interest from the standpoint of possible military use—clairvoyance, telekinesis, and so forth. A detailed description of experiments on this problem is contained in the book by Russell Targ and Kit Harari, "The Psychic Race" (1984). Dr. R. Targ, a psychiatrist also having experience in the

field of laser, optical, and microwave technology, studied parapsychology over a period of 10 years. Together with other scientists, he conducted experiments on studying a person's ability to observe objects beyond visual contact ("sight over distance").

During the sessions, the subject was mentally "see" a specific area or visit it and subsequently describe it in detail. The data received indicated that, on the whole, this task was accomplished satisfactorily, although neither the subject nor the organizers of the experiment knew anything before about the object of observation. Independent persons monitoring the results confirmed the receipt of fairly accurate information. As a result, the prospects of collecting reconnaissance information using long-range sight (remote sight) or telekinesis (out-of-body movement) became obvious.

The framework of this phenomenon is quite broad: on a strategic scale, it is possible to penetrate the enemy's main command and control facilities to become familiar with his classified documents; on the tactical level, reconnaissance can be conducted on the battlefield and in the enemy's rear area (the "clairvoyant-scout" will always be located at a safe place). However, problems do exist—the number of individuals possessing these abilities is limited, and the data received cannot be checked.

According to military experts, using psychokinesis to destroy command and control systems and disrupt the functioning of strategic arms is timely. The ability of a human organism to emit a certain type of energy today has been confirmed by photography of a radiation field known as the Kirlian effect. Psychokinesis is explained by the subject's generation of an electromagnetic force capable of moving or destroying some object. Studies of objects destroyed as a result of experiments conducted have shown a different form of breakage than under the effect of physical force.

Foreign scientists are devoting special attention to telepathic hypnosis. Discovering the mechanisms of controlling this phenomenon of the human organism will make it possible to conduct a direct transfer of thoughts from one person or group of people (telepathic subjects) to a selected audience. It is important here that the subjects not be aware that thoughts are being implanted from an external source. They must think that these are their own thoughts. For example, personnel of an enemy formation executing a sudden breakthrough of defenses, instead of exploiting the success, will try to consolidate on the line achieved or even return to the starting line.

The third direction is studying the effect of bio-emissions on command and control systems, communications systems, and armament, especially electronic equipment, and also development of artificial bio-energy generators and plants for affecting enemy troops and population in order to create anomalous psychic conditions in them. R. McRae, author of the book "Psychic Wars" published in 1984, maintains that some of these studies were conducted when analyzing the behavior of

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combat crews during the course of assessing the vulnerability of basing systems for MX intercontinental ballistic missiles.

It was reported in the American press that CIA specialists are working with the most well-known U.S. parapsychologists to find out if people possessing paranormal abilities can create interference for computer operation.

The fourth and last direction includes developing systems for detecting and monitoring artificial and natural dangerous bio-emissions and also methods of active and passive protection against them. Thus, a number of quantitative methods for the evaluation and practical use of the Kirlian effect have been proposed at a U.S. Navy laboratory for designing "man-machine" systems (Monterey, California).

In the opinion of foreign scientists, the current level of development of physics, chemistry, and biology makes it possible to place the study of the bio-field on a scientific basis, which will help accomplish a number of important tasks of applied importance, including in the military field. Various sensors are used in experiments on bio-energy. They are able to register certain manifestations of the bio-field and transform them into electrical signals that are easily recorded by appropriate instruments, a large number of which have been developed recently. High-capacity computers are used to process the data.

American experts have stated that they are close to solving the problem of controlling a person's ability to emit and receive bio-energy. Creation of technical devices for detecting bio-emissions will continue in the United States in the 1990's, and studies of mathematical modeling of bio-energy interaction between people will develop further.

Today, there is evidence that parapsychological phenomena are real and can be controlled under certain circumstances. An attempt has been made to assess the military potential of such controllable parapsychological phenomena. Claims that psychotronic weapons already exist, although their capabilities have not yet been fully determined, are appearing more and more often in the western press.

It is difficult now to assess the consequences to which the use of psychotronic weapons will lead. Many western experts, including military analysts, assume that the country making the first decisive breakthrough in this field will gain a superiority over its enemy that is comparable only with the monopoly of nuclear weapons. In the future, these type of weapons may become the cause of illnesses or death of an object (person), and without any risk to the life of the operator (person emitting the command). Psychotronic weapons are silent, difficult to detect, and require the efforts of one or several operators as a source of power. Therefore, scientific and military circles abroad are very concerned over a possible "psychic invasion" and note the need to begin work on taking corresponding countermeasures.

Footnote

*The science studying the mechanisms of transforming energy in the processes of the vital activities of organisms.

Turkey's Ground Forces

94UM0387E Moscow ZARUBEZHNOYE
VOYENNOYE OBOZRENIYE in Russian No 2, 1994
(signed to press 7 Jan 94) pp 20-26

[Article by Col S. Nikolayev]

[Text] Turkey's Ground Forces comprise more than 80 percent of the total personnel strength of the armed forces and are intended for conducting military operations jointly with the Air Force and Navy, and also as part of the NATO Armed Forces in the Southern European Theater of Military Operations using conventional and nuclear weapons. The total personnel strength of the Ground Forces is 480,000 people, including 26,700 officers, 26,300 noncommissioned officers, and 427,000 servicemen in compulsory term of service. The Ground Forces have all the main combat arms—infantry (motorized infantry), armored troops, artillery, army aviation, special forces, engineer troops, communications and special purpose troops, and also services—transportation, artillery-technical supply and repair, quartermaster, medical, finance, and others.

Presently, the Ground Forces have four divisions (one mechanized, two motorized infantry, and one infantry), 43 separate brigades (15 armored, 16 mechanized, nine infantry, and three commando), five separate regiments (one motorized infantry, two infantry, and two commando), three training divisions (one armored and two infantry), and combat and logistic support units and subunits. They all are consolidated into four field armies, two separate army corps, a training command, and a logistics command (Figure 1).

About 300 artillery battalions of 203.2-mm howitzers, 175-mm guns, and 155-mm howitzers, up to 20 anti-aircraft and surface-to-air missile (SAM) battalions, over 25 engineer battalions, three army aviation regiments, 10 army aviation battalions, 15 signal battalions, and also logistics subunits are under direct subordination of the commanders of field armies and army corps.

Overall operational control of the Ground Forces is exercised by the commander (an army general) who is appointed by the Council of Ministers on the recommendation of the chief of the General Staff and the minister of national defense and approved by the president of the country. He is directly subordinate to the chief of the General Staff and is responsible for organizational development: manpower acquisition, combat training, and material and technical support of the Ground Forces. The commander exercises command and control of formations, large units, and units through the headquarters (city of Ankara). The chief of staff (corps general) is his first deputy. He manages the headquarters elements,

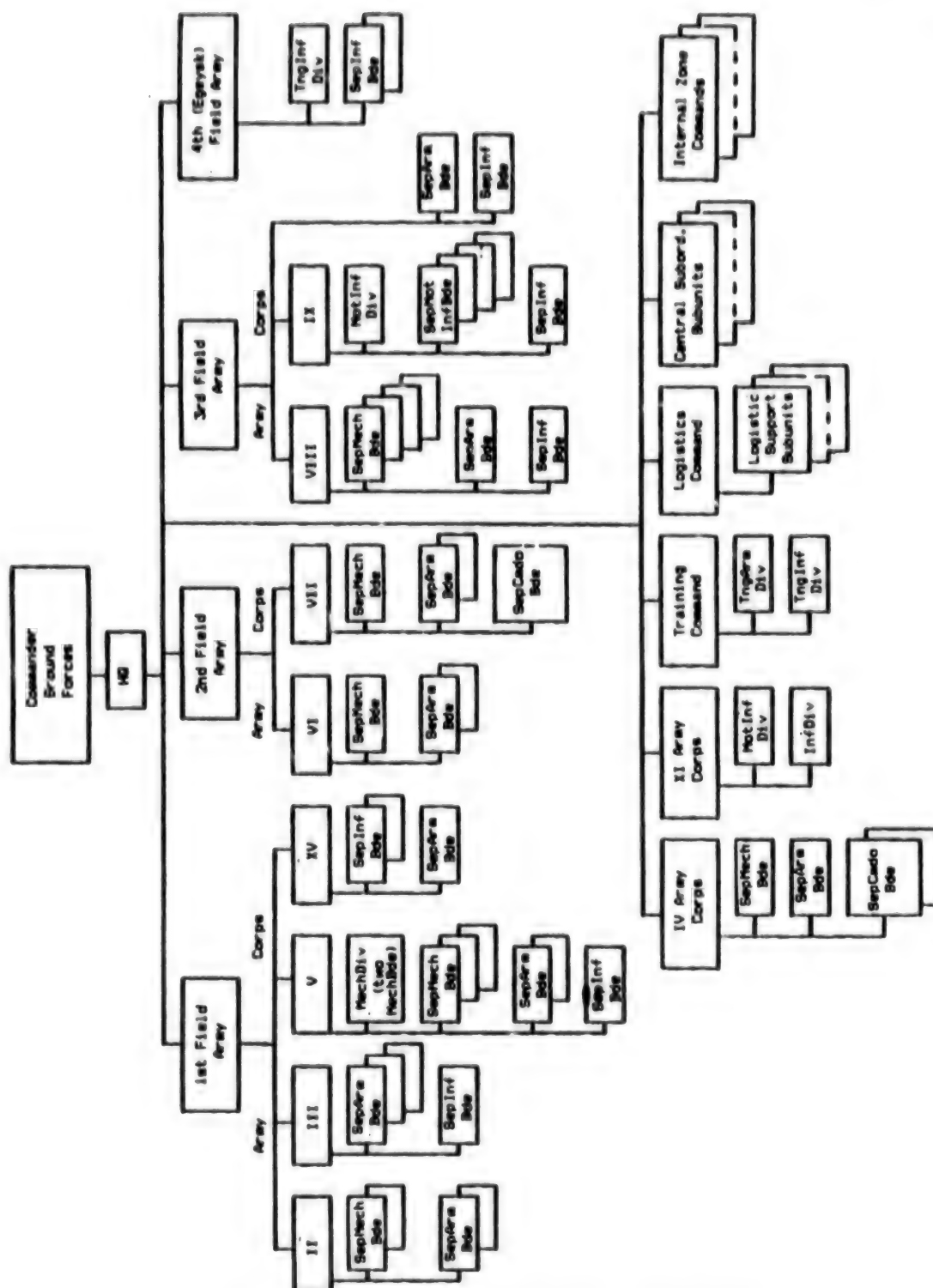


Figure 1. Organizational Structure of Turkey's Ground Forces

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is responsible for the combat readiness of the Ground Forces, planning and allotment of combat assets, determining the budget, selection and procurement of weapons and military equipment, operational and combat training of formations, large units, and units, and coordinates with the command authorities of the NATO ground forces in the northeastern part of the Southern European Theater, with staffs of the Navy and Air Force, and also with ministries and civilian agencies.

The inventory of large units and units of the Ground Forces (counting mobilization stockpiles) includes about 4,000 battle tanks (300 Leopard-1A3, Figure 2 [not reproduced]), 1,980 M48A5, 1,130 M48A2, and 500 M47 tanks), over 4,200 field artillery pieces and mortars (8,330 105-mm M101A1 howitzers, 104 150-mm Shkoda howitzers, 500 155-mm M114A1 howitzers, 150 155-mm M59 guns, 156 203.2-mm M115 howitzers, 300 105-mm M52 self-propelled howitzers, 26 105-mm M108 self-propelled howitzers, 162 155-mm M109 self-propelled howitzers, 34 175-mm self-propelled guns, 24 203.2-mm M110 self-propelled howitzers, 20 227-mm MLRS multiple-launch rocket systems), more than 1,900 81-mm, 106.7-mm, and 120-mm howitzers, up to 4,000 armored personnel carriers (2,460 M113's, 600 M2's and M3's, 300 BTR-60's, 80 AIFV's, Figure 3 [not reproduced]), over 1600 TOW, Milan, and Cobra antitank guided missile [ATGM] systems), up to 2,500 recoilless 75-mm and 106-mm guns, about 1,300 20-mm, 35-mm, and 40-mm antiaircraft artillery pieces, 12 Rapier SAM's (Figure 4 [not reproduced]), 168 army aviation aircraft, 323 helicopters, and also other military equipment.

The highest operational formation of the Ground Forces is a field army, whose commander (an army general) is directly subordinate to the command of the Ground Forces. Its operational command and control body is the staff (chief of staff, two deputies, and four sections: personnel, intelligence, operational and combat training, and logistics). The chiefs of combat arms and services, together with the sections and commands subordinate to them, are part of the army staff as section chiefs.

Depending on the area of responsibility and its combat role, a field army includes two to four army corps and separate combat and logistic support large units, units, and subunits.

The highest tactical large unit is an army corps, which is capable of operating both as part of an army and independently. Depending on the missions given it and the combat tasking area, it includes one to two divisions or three to eight separate brigades, an artillery regiment, and combat and logistic support subunits.

An infantry division (about 15,000 people) includes a command element, three infantry regiments (three battalions each), one artillery regiment (three direct-support artillery battalions, one general-support artillery battalion, and one antiaircraft artillery battery), three battalions (tank, combat engineer, and signal), three companies (headquarters, reconnaissance, and antitank),

and also division rear services. Armament: 50 battle tanks, 70 field artillery pieces, 180 mortars, 150 antitank weapons (including 70 ATGM's), 30 antiaircraft artillery pieces, and 60 portable SAM's.

A motorized infantry division (over 14,000 people) has a headquarters, two infantry regiments, one armored regiment (two tank battalions and one motorized infantry battalion), one artillery regiment, three battalions (tank, combat engineer, and signal), three companies (headquarters, reconnaissance, and antitank), and logistics subunits. Armament: 130 tanks, 130 armored personnel carriers and armored fighting vehicles, 70 field artillery pieces, 130 mortars, 130 antitank weapons (including 60 ATGM's), 30 antiaircraft artillery pieces, and 75 portable SAM's.

A mechanized division (about 11,000 people) includes a headquarters and two mechanized brigades. Armament: 200 tanks, 300 infantry fighting vehicles and armored personnel carriers, 70 field artillery pieces, 90 mortars, 120 antitank weapons (including 60 ATGM's), 16 antiaircraft artillery pieces, and 45 portable SAM's.

The basic tactical large unit of the Ground Forces is the brigade (infantry, mechanized, and armored) on a battalion basis. According to the new organization and establishment, separate brigades will have the following effective strength.

A separate infantry brigade (about 6,000 people) has a headquarters, headquarters company, four infantry battalions, one tank battalion (41 tanks), two artillery battalions of 105-mm and 155-mm towed howitzers, an antiaircraft artillery battery, five companies (reconnaissance, mortar, combat engineer, ATGM with 18 launchers, and signal), logistics subunits (artillery technical supply, motor transport, medical, and quartermaster companies). Armament: 50 tanks, five armored personnel carriers, 36 field artillery pieces, 70 mortars, 70 antitank weapons (including 40 ATGM's), eight antiaircraft artillery pieces, and 35 portable SAM's.

A separate mechanized brigade (over 5,000 people) includes a headquarters, a headquarters company, two motorized infantry battalions (44 armored personnel carriers each), two tank battalions and one reconnaissance battalion (23 tanks), two artillery battalions of self-propelled howitzers (18 each), and a self-propelled antiaircraft artillery battery. Armament: 100 tanks, 200 armored personnel carriers and infantry fighting vehicles, 366 field artillery pieces, 50 mortars, 80 antitank weapons (including 30 ATGM's), eight antiaircraft artillery pieces, and 40 portable SAM's.

A separate armored brigade (over 5,000 people) has a headquarters, a headquarters company, three tank and two motorized infantry battalions, two battalions of 105-mm and 155-mm self-propelled howitzers, a self-propelled antiaircraft artillery battery, and a reconnaissance company (seven tanks). Armament: 130 tanks, 170

armored personnel carrier; and infantry fighting vehicles, 36 field artillery pieces, 36 mortars, 60 antitank weapons (including 30 ATGM's), eight antiaircraft artillery pieces, and 40 portable SAM's. The remaining subunits of mechanized and armored brigades correspond to the structure of an infantry brigade.

A separate commando brigade (6,000 people) is considered special forces and is intended for carrying out commando-type reconnaissance missions and conducting psychological operations and other subversive acts. Its composition includes a headquarters, four commando battalions, and an army aviation battalion. Armament: 145 mortars, 45 antitank weapons (including six ATGM's), and 25 portable SAM's.

The peacetime grouping of the Ground Forces corresponds to the requirements of the plans of NATO and Turkey for conducting military operations in the Southern European Theater of Military Operations. The largest formation of the Ground Forces is located in Eastern Frakia and in the area of the Black Sea Straits—the First Field Army. It is made up of the II, III, V, and XV army corps (one division and 17 separate brigades). In addition to it, the Fourth (Egeysk) Field Army (one training division and two separate brigades) and the XI Separate Corps (two divisions), located on the island of Cyprus, may be used on the Balkan Strategic Axis. The grouping intended for operations on this strategic axis includes more than 50 percent of the divisions and brigades of Turkey's Ground Forces. It has an openly offensive nature. Its composition may include one mechanized division, one motorized infantry division, and one infantry division, up to nine armored brigades, six mechanized and six infantry brigades, and up to two commando brigades. The grouping has more than 2,000 tanks, about 3,500 field artillery pieces and mortars, and 1,400 armored personnel carriers. The 1st Tactical Air Command (over 500 combat aircraft) is assigned for air support on the Balkan Strategic Axis.

The Third Field Army (VIII and IX army corps and two separate brigades) is deployed on the border with states of the Transcaucasus, and the Second Field Army (VI and VII army corps) is deployed in the southeastern part (in areas bordering Syria, Iraq, and Iran). During the course of military operations, some large units of the Second Field Army may be used on other strategic axes, including the Balkan Axis.

Turkey's force grouping on the Caucasian Strategic Axis has one motorized infantry division, six armored brigades, 10 mechanized brigades, three infantry brigades, and one mountain commando brigade (including seven brigades as part of the Second Field Army). This grouping has more than 1500 tanks, about 2,500 field artillery pieces and mortars, and more than 1,100 armored personnel carriers. On the Caucasus Strategic Axis, the grouping of Ground Forces is provided air support by the 2nd Tactical Air Command (up to 270 combat aircraft, Figure 5).

The NATO command authorities assign a special place to Turkey in reinforcing the bloc's southern flank. This is primarily the result of its geographic location, since it borders directly with the Transcaucasus republics and countries of the Near and Middle East, where an unstable internal political situation remains. In addition, Turkey controls one of the most important strategic lines in the Southeastern Theater—the area of the Black Sea Straits. It has one of the largest armies in NATO and has considerable human resources at its disposal.

Mechanized and armored large units and units possess a comparatively high level of armored protection for personnel and offensive and maneuver capabilities. Strong points of the Turkish Ground Forces include a sufficiently high level of training and military discipline of personnel, availability of a large trained reserve, and a developed infrastructure system.

Weak points of Turkey's Ground Forces are: the lack of missiles in large units for delivering nuclear weapons; the presence of various types of divisions and brigades in the order of battle that differ significantly from one another in their offensive and fire capabilities; nonconformity of supply stockpiles to the standards adopted in NATO (for the basic types of supplies, stockpiles do not exceed 30-day requirements instead of the necessary 90-day); the presence of a considerable amount of obsolete equipment in service; poor tactical air defenses. The need to create force groupings for conducting combat operations on disconnected strategic axes also remains a negative factor for Turkey's Ground Forces.

Based on this prerequisite, Turkey's military-political leadership is conducting a set of various measures so the Army, if necessary, can enter a war and conduct combat operations independently or as part of the NATO Armed Forces in the Southern European Theater in the shortest possible time and in an organized manner.

Military operations by Turkey's Armed Forces as part of the NATO Armed Forces will include conducting combat operations on two disconnected strategic axes: the Balkan and Caucasus. The main forms of operational use of Turkish troops on these strategic axes will be offensive and defensive operations of field armies.

Only the first operations of the initial period of war are elaborated in detail in the operational plans systematically practiced at NATO and national exercises. Planning and preparation of subsequent operations is to be accomplished in the process of combat operations depending on the outcome of the first operations.

Combat and operational training of the Turkish Ground Forces is directed at accomplishing tasks for increasing combat and mobilization readiness of the troops, combat proficiency of personnel, and training of large units and units for conducting combat operations jointly with NATO Armed Forces and armed forces of other countries in the Southern European Theater, as well as independently both on its own territory and on adjacent territory.

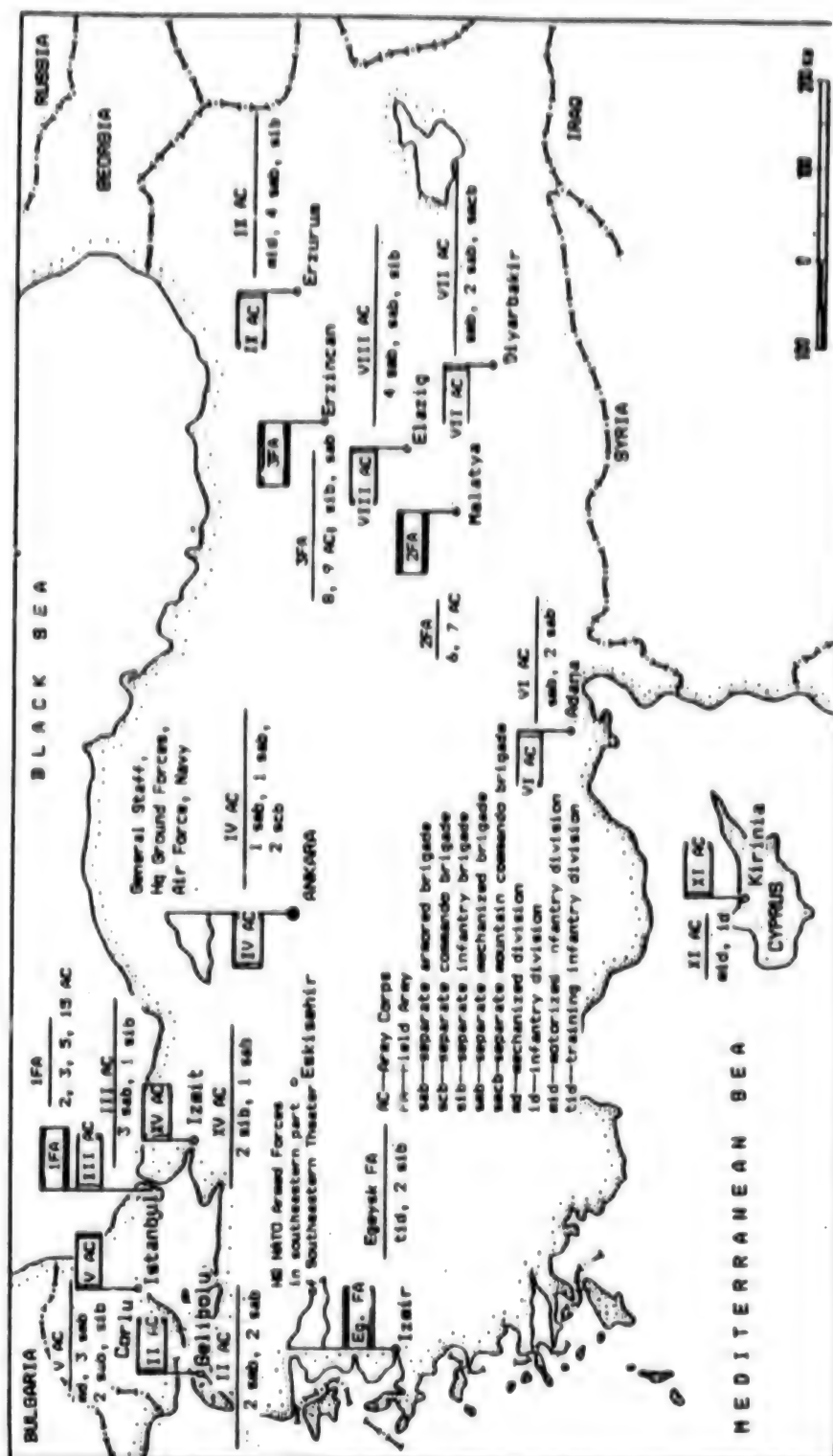


Figure 2. Disposition of Turkey's Ground Forces

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Measures conducted within the framework of NATO, above all for practicing provisions of the alliance's new strategic concept, revising the structure of the NATO and national armed forces, and improving the principles of organizing combat training activities have a significant influence on the course of operational and combat training. The situation in the southeastern areas of the country have a direct effect on fulfillment of operational and combat training plans. Many large units and units of the Second and Third field armies stationed in Eastern and Southeastern Anatoliya are used to suppress antigovernment actions by the Kurds. This is the reason for canceling certain planned measures, but simultaneously makes it possible to practice a number of combat training activities in conditions most closely approximating actual combat against a real operational background. During exercises "Mekhmetchik" (Protector), "Sonbakhar" (Autumn), and "Kysh" (Winter), more attention began to be given to practicing small subunit tactics and training personnel for operations in difficult mountain terrain and winter conditions, and also for conducting diversionary and subversive operations.

Organizational development of the Ground Forces is accomplished in accordance with a plan for their reorganization and modernization for the coming decade. The main goal of the reorganizational measures is to increase the mobility, offensive power, and fire power of large units and units in combating tanks and the air enemy.

A program of transition of the Ground Forces from a division-regiment to a brigade-battalion organization and establishment. In all field armies, a reorganization of army corps is being conducted by disbanding divisions and creating infantry, mechanized, and armored brigades on their basis. In the future, as a sufficient number of tanks, armored personnel carriers, infantry fighting vehicles, and self-propelled artillery enter the inventory, it is planned to reorganize all infantry brigades into mechanized brigades. In the opinion of Turkish command authorities, the new structure facilitates command and control and increases maneuverability and effectiveness of using troops when conducting combat operations in mountainous and heavily broken terrain.

To increase troop mobility, it is envisioned to have as a part of armies and corps subunits of Black Hawk and Super Puma helicopters intended for rapid airlifting of personnel and equipment to crisis areas. Qualitative improvement of the tank fleet is continuing by replacing obsolete models with the more modern M60A1 and A3 and also Leopard-1A3 tanks. There are plans to deliver a total of more than 800 of the newest tanks.

In order to increase the fire power of artillery, it is envisioned to have in its composition battalions of MLRS multiple-launch rocket systems and to re-equip direct-support battalions with 155-mm self-propelled howitzers.

Increasing the effectiveness of tactical air defenses should be ensured by re-equipping antiaircraft subunits

with 35-mm Oerlikon antiaircraft mounts and also by forming in each brigade a platoon of Stinger portable SAM's. In addition, it is planned to have in antitank brigades TOW-2 ATGM's mounted on an armored personnel carrier or infantry fighting vehicle, which will significantly increase their capability for combating enemy tanks. It is also planned to have companies of attack helicopters with ATGM's as a part of army aviation regiments.

Command and control and communications systems will be brought in line with the requirements of waging contemporary and future wars.

Improvement of the mobilization system and methods of training reservists continues for the purpose of rapid mobilization deployment of large units and units.

In the opinion of Turkish military-political leadership, implementing measures provided for by the 10-year reorganization and modernization plan will bring the capabilities of the Ground Forces in full conformity with the requirements of the Turkish military doctrine and also NATO strategy.

Fighter Super-Maneuverability

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[Article by Col V. Babich]

[Text] The concept of super-maneuverability combines two unusual flying capabilities of an aircraft: pitch and yaw orientation regardless of the trajectory of movement and execution of controlled changes in aircraft attitude in a minimum amount of time at large angles of attack.

The problem of super-maneuverability acquired timeliness after third-generation tactical fighters ceased having enough turn rate to seize a position advantage in close combat. If the pilot was not able to realize the element of surprise and the first attack with guided missiles failed, further attempts to seize the initiative in combat rarely succeeded.

The American F-16 fighter, having a thrust-to-weight ratio of over 1:1 (ratio of engine thrust to aircraft weight) and net wing loading of about 300 kgf/m², until the mid-1980's was considered the most maneuverable compared to similar foreign fighters. However, in the last 5-7 years, F-16 aircraft have encountered in aerial combat (especially in the Middle East) fighters possessing similar maneuver characteristics.

Therefore, given the identical level of flight training, the effectiveness of aerial combat dropped sharply, and for the attacker it often ended unsuccessfully. Usual descending and ascending steady and accelerated turns, banked turns, and vertical turns did not ensure a quick recovery of the aircraft in the area of possible attacks.

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Modeling has shown that for a successful attack, after entering the rear hemisphere, it is necessary to have freedom of movement of the fuselage while maintaining flight trajectory in the vertical plane within 6 degrees and in the horizontal plane within 4 degrees. At the same time, on series-produced fighters, even when using high-lift devices (flaps and slats), the possible range of angles was limited to 2 degrees.

In these conditions, super-maneuverability as a nontraditional method of solving the problem makes it possible to improve considerably the flying capabilities of the aircraft. To achieve this, they installed on a series-produced F-16 fighter a dual canard wing, a mini-wing under the air-intake in the lower part of the fuselage, and also a system for controlling the additional control surfaces using a computer. This program was called AFTI (Advanced Fighter Technology Integration). Studies showed the main thing: the possibility of executing changes in aircraft attitude not accessible for another aircraft.

During testing, the F-16 AFTI fighter moved up and down relative to the flight trajectory (perpendicular to the horizontal plane), executed a flat turn with wings level, and maintained the longitudinal axis (aiming line) in one direction, briefly moving in another.

As foreign experts believe, relatively uncomplicated mechanical improvements not requiring large expenditures provided an appreciable improvement in aerodynamic characteristics, resulting in an increase in effectiveness of close combat. Offensive maneuvers were completed with cannon fire after the aircraft quickly changed to the required lead angle. The so-called "reverse" technique consisted of the aircraft making a wings-level horizontal turn, thereby ensuring an initial position advantageous for an attack at a short distance. Evasive maneuvers with horizontal and vertical movements made it possible at the critical moment to escape the area of possible enemy attacks or let the enemy go ahead, subsequently coming out into his rear hemisphere. In addition, the aircraft's vulnerability when attacking a ground targets with heavy air defenses decreased sharply. The pilot aimed, evaded enemy anti-aircraft fire, and simultaneously closed in on the target. Unusual deviations in flight trajectory briefly brought the aircraft to a position guaranteeing safety and execution of an effective attack.

Assessing the scientific aspect of the experiment, aviation experts noted that practical use of the phenomenon of super-maneuverability is linked to the interaction of man and equipment. An experienced pilot, capable of making nonstandard decisions, which a computer helps him carry out, in virtually five out of six cases occupies an advantageous position. At the same time, the level of restrictive psycho-physiological factors turned out to be higher than expected. When executing nonstandard maneuvers, made not as a pilot's experience and intuition prompted him, he was disoriented in the most critical stages of combat. Therefore, the research program used voice systems for controlling the aircraft.

Experts consider a negative factor to be the emergence of hard-to-withstand g-loads during the course of abrupt lateral movements of the aircraft without a decrease in approach speed. Under the strong and sudden effect of aerodynamic forces, the pilot sometimes lost consciousness for 30 seconds. In close combat, this was sufficient to be hit by enemy fire, and a training fight at low altitude could end in disaster. Attempts to eliminate the dangerous phenomenon by technical means were unsuccessful. Deviating the pilot's seat-back to make it possible to decrease the effect of g-loads on the "chest-back" direction has been rejected by practice. Installation of specially developed g-limiters began to hinder the full use of nonstandard maneuvers, although it guaranteed flight safety.

In the opinion of experts, the experienced gained did not reject the search for other ways to increase maneuverability. The German firm Messerschmitt-Bolkow-Blom developed maneuverability requirements for new-generation fighters. The first of them concerns a more rapid change in the direction of flight at transonic and supersonic speeds. In all-aspect combat with priority use of medium-range guided missiles, it is important to take up an advantageous position before the enemy or foil his attack by going to a safe zone. The second requirement is to improve maneuverability in the subsonic regime. Experience of testing experimental aircraft shows that an advantage in angular turn rate of only 3 degrees per second at Mach 0.8 gives a pilot a chance for victory in close combat. The maximum value of the angular rate for a modern fighter with a net wing loading of 300 kgf/m² is as much as 25 degrees per second. It is impossible to exceed this limit without changing the design of the aircraft and without achieving fundamental improvements in aerodynamic characteristics. The third requirement stemming from combat tactics is ensuring controllability at low speeds (under Mach 0.3) and high angles of attack. Specialists are concentrating special attention on this.

A modern fighter is not able to maneuver at high (by standards of the immediate future) angles of attack. The above-mentioned F-16, loses directional stability after reaching angles of attack greater than 30 degrees, and goes into the area of a deep stall upon achieving 60 degrees. But experience shows the extreme undesirability of such restrictions that interfere with quickly taking up an advantageous position in aerial combat. The need to execute steady turns at angles of attack greater than 50 degrees has become very clear. Experience has shown that at an angle 20 degrees, a flight trajectory with a 180-degree change in direction is twice as long than at 50 degrees.

In addition to a maximum angular rate exceeding 30 degrees per second, super-maneuverability is characterized by an aircraft's ability to quickly increase the angle of attack to 90 degrees (in 2-3 seconds) and then return to the initial position without a deceleration of the pace. According to the AIR FORCE MAGAZINE, the Russian Su-27 aircraft came closest of all to executing this maneuver, confidently executing a "cobra" maneuver, which no other fighter so far has been able to repeat.

However, the "cobra" is just the first step toward super-maneuverability. This is still not controlled flight at supercritical angles of attack. In this case, the behavior of the aircraft is similar to a compressed spring, the initial deformation of which is set by the longitudinal control element, and its stiffness corresponds to the longitudinal stability reserve.

According to the Russian magazine AVIATSIYA I KOSMONAVTIKA, approaches to super-maneuverability in Su-27 and MiG-29 aircraft are supported by a successful aerodynamic configuration and efficient tailplane arrangement. But these aircraft are also predisposed to stalling. If the permissible angle is exceeded, an uncontrollable slip begins to develop with a subsequent pre-spin condition. However, the inertia of the aircraft, the short duration of the maneuver, and the pilot's anticipatory actions prevent critical conditions from emerging.

During the course of modeling conducted by the American firm Ademics International, an attempt was made to discover the role and place of the super-maneuverability regime in aerial combat between advanced fighters and also in combat between different generations of aircraft (Figure 1). Pilots located in the cockpits of a half-scale modeling complex began combat from the moment the element of surprise was lost, that is, the first head-on attack by guided missile was considered unsuccessful. In real combat in the Middle East, such a situation arose roughly after every other head-on approach of aircraft. That is when the enemy also began fighting for a position convenient for using short-range weapons.

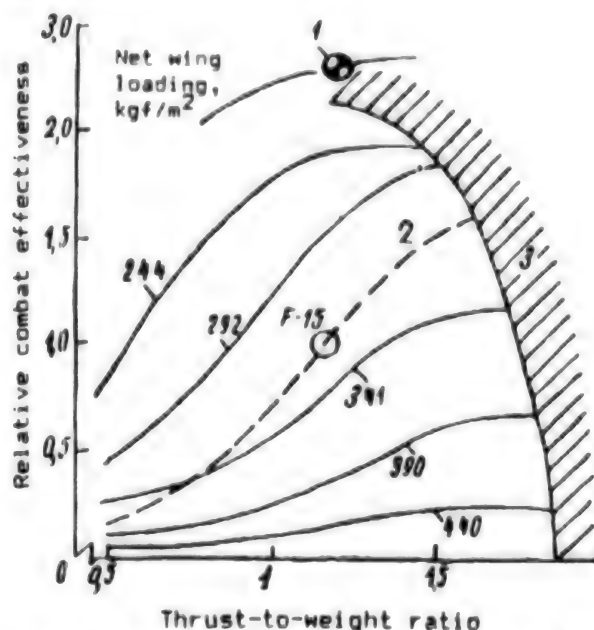


Figure 1. Modeling of super-maneuverability regime in aerial combat between advanced fighters and aircraft of different generations (1—super-maneuverable fighter; 2—F-15 tactical fighter; 3—region of technical limitations)

Statistics show that the time the enemy is located in the near-stall region was approximately one-tenth of the total duration of the combat. Approximately 15 percent of the time in this region was used for weapon use: tracking, aiming, and launching missiles (firing cannon). The average flight speed was Mach 0.3; the average g-load compared to the initial stage of combat at transonic speeds dropped more than one g-load; and the angles of attack (the limits of which were tentatively removed) increased to 70 degrees.

The advanced fighter made twice as many missile launches and 10 times as many aimed cannon bursts. It is particularly important that superiority in maneuver combat became decisive in the area of critical regimes, when the super-maneuverable aircraft continued to execute a turn on the enemy, and the enemy went into a stall. A decrease in g-loads as the aircraft made the transition to lower flight speeds ensured better conditions for pilot efficiency. It is known that at g-loads above four, aiming and firing the cannon at a lead point are extremely difficult.

The results of the half-scale maneuvering (on a simulator) directly affected the working up of requirements for advanced fighters. Basically, the assessments came down to the following: the future fighter needs super-maneuvering in order to achieve a position advantage in combat, and limitations on angle of attack and controllability at low flight speeds lead to a decrease in its offensive and defensive effectiveness. What kind of technical improvements on aircraft of the future can eliminate these undesirable limitations?

On a prototype of the American F-22 advanced fighter undergoing testing, high aerodynamic characteristics put into the design are supplemented by a decrease in drag by placing the weapons inside the fuselage (on series-produced F-15 and F-16 aircraft, guided missiles are hung on external points). But the main achievement is considered to be the use of a thrust vector deflection system. The primary structure is supplemented by a two-channel rectangular nozzle with large flaps and a hydraulic drive, which can direct the flow of engine exhaust gases 20 degrees up or down, increasing the capabilities of pitch control. Rotating the thrust vector in the vertical plane made it possible to maneuver without stalling to an angle of attack of 60 degrees at a surprisingly low flight speed—150 km/hr. Thrust deflection provided roughly twice the angular rate and four times higher rate of pitch change with a rapid return to normal flight regime (100 degrees per second and 60 degrees per second, respectively).

The high maneuverability of the experimental X-31 (Figure 2 [not reproduced]), which was built jointly by U.S. and German firms, is achieved by combining the actions of conventional aerodynamic control surfaces and thrust vector control by equipping the engine nozzle with three deflectors in the exhaust gas stream (an upper horizontal one and two others located along the contour

of the nozzle). Alternate or simultaneous deflection of the gases within the range of 20 degrees provides a change in position in the horizontal and vertical planes. The aircraft control system computer actuates the defectors in the stall mode, when the effectiveness of the aerodynamic control surfaces is insufficient. With a further increase in the angle of attack, flight control of the aircraft is accomplished completely by thrust vector deflection (the transition period lasts 3-10 seconds). When decreasing the angle of attack to critical or less, the control functions are transferred to the aerodynamic control surfaces.

Figure 3 illustrates the advantage of a super-maneuverable aircraft compared to a conventional fighter when they are merging on reciprocal headings. A conventional fighter gaining altitude with a combat turn loses the speed for reducing the turning radius. The X-31 aircraft executes the same maneuver, but expends energy in a climbing turn (g-load of nine), achieving supercritical angles of attack at a low speed, then executes a 130-degree turn to launch the guided missile, while a conventional fighter has time to make only a 90-degree turn.

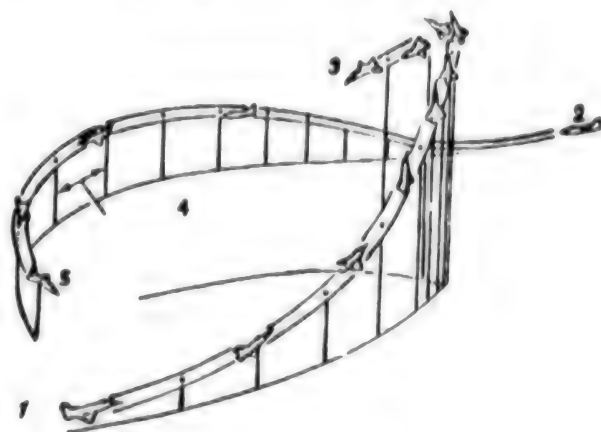


Figure 3. Comparative characteristics of a super-maneuverable aircraft and a conventional fighter on head-on approaches (1—X-31 aircraft; 2—conventional fighter; 3—guided missile launch; 4—identical time intervals; 5—conventional fighter at moment of guided missile launch by X-31 aircraft)

In addition to the rotating thrust vector, an unusual aircraft configuration also opens the way to super-maneuverability. For several years now the experimental X-29 with a forward-swept wing has been undergoing testing. Angles of attack of 66 degrees have been achieved without stalling when maneuvering with a g-load of one and 35 degrees at a g-load of three. In the first case, the aircraft flew at a speed of 148 km/hr. Blowing off the vortices by various methods of boundary layer control to increase aircraft stability in the critical envelope is also considered promising.

According to some estimates, super-maneuverability will make it possible to increase three- to four-fold a fighter's effectiveness in close combat using cannons. However, changing the position of the aircraft nose may prove to be no different than replacing the guided missile with broad capabilities of attacking a target at high angles. Today, the tactical feasibility of using super-maneuverability at low speeds is quite disputable.

It is fairly complicated to accomplish the process of completing a rapid turn on the enemy with the use of weapons. Effective cannon fire today is possible from the rear hemisphere of the target with a deflection angle of up to 40 degrees from the center line. The pilot must steadily track the target, calculate the lead angle, and reduce the distance along the pursuit curve with strict coordination of actions.

The American firm General Electric has developed a new sight which, combined with the onboard radar target tracking system, can support an attack with cannon weapons from any direction. The form of information display on the cockpit windscreen has changed for this. The pilot first maneuvers the target position in the outer wide ring of the "cone," then frames it with the narrow ring, and gives a burst. On a training flight (without opening fire), when pressing the firing button, the point of the shell burst illuminates on the display after a time equal to the flight of the shell. Coordinates of the target and the point of burst are given on a real time basis.

Tests have shown that in simulated combat with the new sight, the number of successful attacks at a large angle from the forward hemisphere increased four-fold, and doubled in the "from the side and rear" position. During the training, the pilot achieved the required level of skill in conducting attacks twice as quickly. He was aided considerably by the information on the cockpit windscreen about the required parameters of the maneuver, especially the bank angle, for maintaining an advantageous position with respect to the target being pursued. A aircraft cannon on a turret and an all-aspect sight are part of the automatic flight control system that was tested on the F-15 aircraft.

Evaluation flights of an advanced fighter equipped with a turret-mounted cannon were conducted by Northrop (USA) on a half-scale modeling complex with pilot participation. The range to the target and the range rate were measured by a special unit which automatically regulated engine thrust and controlled the air brakes to keep the aircraft in the "kill" position.

The cannon moved in the pitch and yaw planes. A triangle illuminated on the windscreen to indicate the kill space. The pilot's task was to pilot the aircraft to bring the target within the "frame" and keep the range to the target at 2700-150 meters. After the "frame" began blinking, he opened fire. The pilot did not have to mark the maneuvering target or perform a complex tracking process. The automatic system independently rotated the cannon to the lead angle.

The following limit of cannon movement was established: 5 degrees upward, 1 degree downward, and 3 degrees along the yaw axis with angular rate of rotation of 40 degrees per second. According to experts, efforts spent on creating the system were justified by the results obtained. The ratio of hits to the number of shells expended and also the number of successful bursts to the total number made was approximately double that obtained with a fixed cannon. On the super-maneuverable modern combat aircraft, cannon weapons are attached rigidly on the center line. This factor does not make it possible to fully realize the achievements associated with deflected thrust vector, forward-swept wing, all-aspect sight, and also nonstandard maneuvering.

Status and Prospects of Development of New-Generation Dirigibles

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[Article by P. Kachur]

[Text] The first part of this article¹ was devoted to general problems of creating modern dirigibles. Below we present a review of individual structural components and onboard equipment and outline problems of using dirigibles for military purposes.

Cabins, gondolas, and cargo compartments are used to house the crew, passengers, engines, gear, and equipment and to transport cargo. Their design depends on the configuration adopted. The main problem is ensuring sufficient strength with a low weight and also secure attachment to the body.

On the first models of soft dirigibles, the gondolas were suspended on lines from the gas bag. A net was placed on the gas bag, and in its lower part it narrowed and ended with releases and lines, to which a suspension ring was attached. The gondolas at that time were wicker baskets made of twigs; they were sufficiently light and provided good shock absorption during landing. However, such a method of attaching the gondolas was noted for unevenness of load on the gas bag.

On semi-rigid dirigibles, the gondola (cabin, cargo compartment) is attached to a rigid truss keel beam, absorbing the load and distributing it more evenly over the gas bag.

On rigid dirigibles, the control cabin, passenger gondolas, and cargo compartments are rigidly connected to the framework, and the cargo compartments, which are a primary structure, are located inside the body.

Heat-insulation materials are used to a greater degree in gondolas of dirigibles intended for operating in northern areas. Their bottom is made waterproof in the event of an emergency landing on water, and buoyancy is increased by means of floats attached to its body.

Modern dirigibles make wide use of lightweight reinforced plastics. Thus, the lower part of the rigid body of a dirigible developed by the British firm Cargo Airship has a cargo platform made of fiberglass plastic panels. The gondola of soft MF dirigibles (Great Britain), designed for transporting up to 10 tons of cargo, is suspended under the gas bag and made of light alloys and fiberglass.

The gondola of the AD-500 dirigible (Great Britain, 9.2x2.4x2.4 meters) is made of a heat-resistant (up to 120 degrees) composite material. The framework of the body and bulkhead are three-ply panels with a honeycomb filling of plasticized cardboard and a skin of glass cloth. The partition between the passenger cabin and the motor compartment is metallic. The gondola is attached to the body by 12 lines made of composite material. There are nine chairs inside it (two for crew members and seven for passengers).

The monocoque gondolas of Skyship-500 dirigibles (Great Britain) are made of plastic reinforced with Kevlar; the pressure bulkheads and floor panels are made of Fibrolan; the pressure bulkheads of the motor compartment are made of a fireproof material with a honeycomb filling and an skin of stainless steel.

The gondola of the Sentinel-5000 dirigible (military designation YEZ-2A), developed jointly by the British firm Airship Industries and the American firm Westinghouse for the U.S. Navy, (see figure [not reproduced]), has three pressurized decks. Crew (10-15 people) living spaces are located on the top deck; control consoles, radar equipment, fuel stores, and support equipment are located on the middle deck; and the cabin with control elements is located on the lower deck.

An original design was patented in 1978 in the United States. The upper part of the gondola, shaped like a railcar, has rollers with hinges. They slide along a rigid longitudinal rail attached to the body of the dirigible. Such a design makes it possible to balance the dirigible when loading (unloading).

The cargo compartment of the American Megalifter dirigible (91x12x12 meters) is situated in the lower part of the body. The compartment for transporting containers is situated similarly on the Aeron-340 dirigible.

Landing and mooring devices, ground equipment. Ensuring accident-free landing and mooring was and remains a serious problem of operating dirigibles. Controlling them near the earth's surface is made considerably more difficult due to the decrease in the effectiveness of aerodynamic control surfaces, since it depends on the air flow velocity. Up to the present, the following methods were used for controlling the dirigible on landing: changing engine thrust, ballasting, and discharging gas. At this stage, help of quite a large ground team was required.

Labor-intensive mooring operations were simplified and mechanized by the 1960's. Thus, tethering such a large

dirigible as the ZPG-3W (USA) was accomplished by a ground team of 12-18 people with two mobile winches. This required about 100 people in the 1930's.

Modern dirigibles are equipped with landing wheel struts similar to aircraft landing gear. For example, the Skyship-500 has a single strut in the rear with a rotatable wheel, enabling it to turn around the mooring mast depending on the direction of the wind.

Mooring devices vary widely, but the primary element is the mooring tower (or mast), to which the nose of the dirigible is attached. It includes a device which can rotate freely in the horizontal plane together with the secured dirigible. The dirigible's position is controlled by using a winch. Modern construction technology makes it possible to create huge sunken hangars with a retractable roof for accepting cargo dirigibles.

The main "lifting" gas for dirigibles of past years was hydrogen the main shortcomings of which were explosive risk and fire risk. When inert helium possessing 93 percent of the lifting properties of hydrogen is used, these shortcomings are eliminated. One cubic meter of helium can lift one kg of cargo.

A very serious shortcoming of helium is fluidity—it leaks through most materials not permeable for air. Therefore, the main problem in using helium in lighter-than-air aeronautics is creating a material suitable for use in gas bags.

In addition to hydrogen (for example, desensitized hydrogen) and helium already being used, hot air can also be used as a "lifting" gas, but in this case it is necessary to have a burner and fuel supply.

The same **onboard equipment** is installed on dirigibles as on all modern heavier-than-air flying vehicles: flight control and navigation equipment; engine monitoring equipment; radio communications and special equipment. The design of certain types of equipment (for example, anticipating equipment) differs from aircraft devices with a similar purpose. Special equipment, depending on the task to be accomplished, may include reconnaissance and surveillance (radars, infrared sets, television cameras), electronic warfare, and communications equipment.

When used as transporters or launchers for missiles, dirigibles are additionally equipped with devices supporting the lifting and loading of missiles, the necessary temperature and humidity conditions, and also launch equipment.

Studies of the **prospects of using dirigibles for military purposes** in recent years have been conducted primarily in the United States and Great Britain. In particular, at the request of the U.S. Navy, Princeton University conducted an assessment of the possibility of creating antisubmarine warfare [ASW] dirigibles. Preference was given to two types of dirigibles: one with a large-volume body and flight duration (designed for detecting submarines in ocean areas and tracking them, operations on

ASW lines, convoy security); one with a relatively small-volume gas bag and low self-sufficiency (may be used to search for submarines in coastal areas). The design characteristics of such dirigibles are given below.

Design Characteristics of Dirigibles

	With long flight duration	With short flight duration
Body volume, cubic meters	170,000	34,000
Cruise speed, km/hr	220	185
Flight altitude, meters	3,000	3,000
Flight duration, hrs	240	8

In addition, university experts examined several variants of military transport dirigibles. It turned out that a dirigible with a body volume of 280,000 cubic meters can deliver a payload of 45 tons at a speed of 420 km/hr a distance of up to 300 km.

The firm Goodyear conducted design research for creating a military transport dirigible designed for strategic airlifts with a flight range of up to 8,500 km. A hybrid design with the following characteristics was chosen: a length of 425 meters, a maximum width of 116 meters, 1,100,000 cubic meters of "lifting" gas, a maximum takeoff weight of 1,140 tons (payload of 367 tons), a flight altitude of 1,500 meters, and a cruise speed of 150 km/hr (maximum speed of 210 km/hr). According to the firm's specialists, such a variant can be created by the late 1990's.

In the 1960's, U.S. Air Force experts examined the possibility of using dirigibles to transport stages of powerful launch vehicles and also transporter-launchers for intercontinental ballistic missiles [ICBM]. In particular, they proposed a variant for delivering Saturn-5 launch vehicle stages from the manufacturing plant to Cape Canaveral. Goodyear developed for this purpose a dirigible 170 meters long and 37.5 meters in diameter. It could transport externally suspended a rocket stage 10 meters in diameter and weighing 50 tons for a distance of up to 3,500 meters.

Department of Defense specialists prepared a dirigible design with a toroidal shape for transporting and launching heavy ICBM's, for example, Minuteman missiles. The lower part of the body contained a gondola for three engines and instrument equipment, the control cabin, and a container with a 45-ton missile. To accept the missile, the dirigible hovers at an altitude of 30-40 meters; the missile is then raised with winches and pulled into the container. The speed of the dirigible with missile is 120 km/hr at an altitude of 6,000 meters.

Studies of various concepts of using dirigibles for launching ICBM's conducted in the late 1970's generally led to favorable results. Two variants were examined: continuous airborne alert with ICBM's and relocation of missiles by dirigibles from one point to another.

In continuous airborne alert, the dirigible take off from staging points on the territory of the United States and fly at slow speed to the patrol areas over the ocean water area. As military experts believe, dirigibles can preserve the combat effectiveness of the strategic missile system for an extended period of time.

Three types of dirigibles were proposed that were capable of carrying from one 20-ton missile (maximum payload weight for the dirigible was over 45 tons) to three 35-ton missiles (maximum payload 135 tons).

For the airborne alert variant, preference was given to a dirigible with a body volume of 400,000 cubic meters, 300 meters long, and with a maximum takeoff weight of 360 tons.

The rigid framework is made of composite materials and covered with a bag of Dacron and Mylar or nylon and Mylar. The turboprop engine is located in a gondola, which makes it possible to service it during flight.

In the variant of relocating ICBM's, the dirigibles move missiles between a large number of fixed launch positions (up to 30 per ICBM) dispersed over a vast territory. To do this, it is planned to use a dirigible whose body has a volume of 170,000 cubic meters, a maximum takeoff weight of 150 tons, a length of 220 meters, and a cruise speed of 200 km/hr. The missile container is delivered to the ground launcher in a removable compartment.

It is also envisioned to use the Megalifter dirigible to airlift MX ICBM's. It is planned to secure the missile on a special platform suspended under the dirigible.

However, all the numerous projects for using dirigibles to transport and launch ICBM's were not implemented.

A remotely controlled High Spot dirigible, developed by Lockheed for the U.S. Navy, is of interest. It is designed for communications, surveillance, and over-the-horizon target designation from high altitudes. The body has a volume of 142,000 cubic meters, a length of 157 meters, and a diameter of 46.5 meters. The payload, consisting of radar and communications equipment, data display and transmission equipment, is located in a gondola, and the antennas are inside the body. The dirigible will hover over the desired area at an altitude of 18-24 km for 150 days. In the opinion of the firm's experts, it is approximately 10 times cheaper to accomplish these tasks with such dirigibles than with satellites.

Today, the American firm Westinghouse and the British corporation Airship Industries occupy the leading positions abroad in creating dirigibles for military use and

onboard equipment for them. Main efforts are concentrated on conducting experiments demonstrating the capabilities of various types of special equipment (installed on the Sentinel-1000 dirigible) and also on building the Sentinel-5000 dirigible.

Experts from Westinghouse believe that the Sentinel-1000 can be used to accomplish the following missions: long-range radar detection of air and surface targets, over-the-horizon target designation, surveillance and reconnaissance, patrolling coastal areas and land borders, and conducting electronic warfare. Experiments on over-the-horizon target designation are scheduled to be conducted in 1995 using a modified AN/APG-66 radar operating in the X-band (8-12 GHz, used on the F-16 aircraft). For long-range radar detection, it is planned to use a modified ASSR-1000 L-band radar (1-2 GHz), making it possible to detect low-flying targets with a radar cross-section of 3 cubic meters at a distance of up to 300 km. Either the AN/APS-134 or AN/APS-137 (X-band) radar will be selected for reconnaissance and surveillance. When accomplishing border patrol missions, the onboard equipment will include the AN/APG-66 radar, a forward-looking infrared station, and a low-level color television camera. The composition of the electronic warfare equipment has not yet been determined.

Development of the YEZ-2A dirigible began in 1988, and significant changes were made to the project during the course of it. In fiscal year 1994, Westinghouse hopes to receive an order for series production, and the first flight is scheduled for 1998. It is planned to install a large phased-array radar on the dirigible² to accomplish long-range radar detection of surface and air targets and warning of operational-tactical missile launches.

In the opinion of foreign military experts, dirigibles will be able to increase considerably the capabilities of advanced weapon systems. By the late 1990's, one can expect the appearance of various types of dirigibles able to accomplish many defense missions in the most developed countries.

Footnotes

1. For the beginning of this article, see: ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1994, No 1, pp 36-44.
2. For more details about this dirigible, see: ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1990, No 11, p 41.

Status and Prospects of Development of NATO Countries' Navies

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VOYENNOYE OBOZRENIYE in Russian No 2, 1994
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[Article by Capt 1st Rank V. Aksenov and Capt 1st Rank A. Lavrykov]

[Text] *The first part of the article* dealt with questions concerning the status and prospects of development of the American Navy. Below, based on foreign press materials, we examine the navies of Great Britain, France, Germany, and Italy, which number about 360 ships and 80 craft, with over 70 ships in various stages of construction to be commissioned in the next few years.*

Great Britain has the largest navy in Western Europe, consisting of 113 warships (four nuclear-powered missile submarines, 13 nuclear-powered attack submarines [SSN], and five diesel submarines, three light aircraft carriers, 12 destroyers, 26 frigates, 10 patrol ships, 33 minesweepers, and seven amphibious ships) and 20 patrol craft. The personnel strength of the Navy is 53,600.

Over the next four years, it is planned to replace four obsolete Resolution-class nuclear-powered ballistic missile submarines [SSBN] built in 1967-1969 with new Vanguard-class submarines (S28-31). The first combat patrol by the lead SSBN, launched in March 1992, is scheduled for late 1994. The order for the fourth submarine was issued in July 1992. The submarine has a submerged displacement of 16,000 tons, a hull length of 149.9 meters, a width of 12.8 meters, and a draft 12 meters. The 27,500-hp nuclear powerplant supports a top submerged speed of 25 knots. Armament consists of 16 Trident-2 submarine-launched ballistic missiles [SLBM] with 128 MIRVed warheads with a yield of 150 kt each (British made) and Spearfish and Tigerfish torpedoes (four 533-mm torpedo tubes. The SSBN has two 135-man crews.

The British Navy has 13 SSN's: seven Trafalgar-class (S87, 88, 90-93, and 107), five Swiftsure-class (S104-106, 108, 109), and one Valiant-class (S102). In the last two years, one Swiftsure- and one Valiant-class submarine have been decommissioned. In 1994, it is planned to remove the last Valiant-class submarine from service.

The Trafalgar-class SSN's are the most modern. They have a submerged displacement of 5,208 tons, a hull length of 85.4 meters, a width of 9.8 meters, a draft of 9.5 meters, a 15,000-hp nuclear powerplant, and a top submerged speed of 32 knots. They are equipped for under-ice navigation. They have a 97-man crew, including 12 officers.

All nuclear-powered submarines are armed with Harpoon antishipping missiles, torpedoes, and mines.

Plans call for building a series of six modernized Trafalgar-class SSN's somewhat larger in size and displacement. They will be equipped with a more powerful

powerplant. The order for construction of the lead ship is to be scheduled for 1995, and commissioning is set for the year 2001.

The diesel submarines in service, including four Upholder-class (S40-43) and one Oberon-class (S19), are to be withdrawn into the reserve in the next few years or sold overseas. The Upholder-class submarines (Figure 1 [not reproduced]) are one of the most modern in the West (transferred to the Navy in 1990-1993). Their submerged displacement is 2,455 tons; the basic dimensions are 70.3x7.6x5.5 meters; powerplant power is 5,400 hp, top submerged speed is 20 knots; cruising range is 8,000 miles at 8 knots. Storage batteries support 90 hours of cruising at 3 knots. The submarine is armed with six 533-mm torpedo tubes; its battle reserve includes Harpoon antishipping missiles, torpedoes, and mines. It has a 47-man crew, including seven officers.

The largest ships of the British Navy are the light aircraft carriers R05 Invincible, R06 Illustrious, and R07 Ark Royal, built in 1980-1985. In recent years they have been undergoing a modernization, during which the ramp on the flight deck is being improved, and more modern surface-to-air missile and antiaircraft artillery systems are being installed.

Destroyers are represented by 12 Birmingham-class ships of three modifications (D86-88 and 108, D89-92, and D95-98, respectively) transferred to the Navy in 1976-1985. British, French, and Italian experts are considering a project for joint construction of a new-generation destroyer with a displacement of about 6,200 tons. The order for the lead ship in a series of 12 ships is tentatively planned to be placed in 1996 and be commissioned in the year 2002.

Frigates are the most numerous class of ships in the British Navy: 14 Broadsword-class of three modifications (F88-91, F92-96 and 98, and F85-87 and 99), three Amazon-class (F171, 174, and 185), two Leander-class (F57 and 71), and seven Norfolk-class (F229-231, 233-235, and 237). In the next two years it is planned to remove all Amazon- and Leander-class ships from service. Presently, the construction of six more Norfolk-class frigates has been financed, with commissioning of the 12th and 13th in 1997. In the future it is planned to build 10 more of these ships.

The Navy's patrol forces include 10 ships: A171 Endurance, two Leeds Castle-class (P258 and 265), and seven Island-class (P277, 278, 295, 297-300). They are designed to protect the 200-mile economic zone and oil and gas complexes in the North Sea.

Great Britain's Navy has at its disposal considerable minesweeping forces, numbering 33 ships of four classes: 13 Brecon-class (M29-41), 12 River-class (M2003-2014), three Ton-class (M1114, 1166, and 1181), and five Sundown-class (M101-105). Construction of five more Sundown-class ships will probably begin this year.

The Navy has seven large amphibious warfare ships: L10 Fearless, L11, Intrepid, four Sir Bedivere-class (L3004, 3027, 3036, 3505) and Sir Galahad (L3005). There are plans to build two new ships with a displacement of 13,500 tons (commissioning of the lead ship is scheduled for 1998) to replace the obsolete Fearless and Intrepid, as well as one helicopter carrier with a displacement of 17,000 tons (1997).

On the whole, the British Navy is still one of the leaders in the world in numbers and balance, as well as in degree of combat readiness and level of operational capabilities.

At the beginning of this year, the French Navy had at its disposal 83 warships (five SSBN's, six SSN's, eight diesel-powered submarines, two aircraft carriers, one helicopter carrier, 15 destroyers, 17 frigates and corvettes, 20 minesweepers, and nine amphibious warfare ships) and also 10 patrol craft and four landing craft. The Navy's numerical strength is 64,000 people.

The sea-based strategic nuclear forces are represented by five Inflexible-class SSBN's, previously named Le Redoubtable (S610, 612-615), transferred to the Navy in 1974-1985. Two ships of the new Triumphant-class (S616 and 617) are being built to replace them, and another two are scheduled to be built. It is planned to commission the first three SSBN's in 1995, 1998, and 2000, respectively. They have a submerged displacement is 14,120 tons and basic dimensions of 138x12.5x12.5 meters. The 41,500-hp nuclear powerplant makes it possible to develop a top submerged speed of 25 knots. Armament consists of 16 M45 (until 1999) and M5 SLBM's, 18 Exocet antishipping missiles, and torpedoes. There are two 111-man crews, including 15 officers, for each submarine.

Two Rubis-class SSN's—S605 Amethyst and S606 Pearl—have entered the Navy in the last two years in addition to the four submarines built earlier (S601-604). They are all armed with Exocet antishipping missiles, torpedoes, and mines. In 1995-1997, appropriations are to be allocated for creating a new class of SSN with a displacement of 4,000 tons and equipped with a vertical launcher for antishipping missiles.

It is planned to operate the Daphne- (S643, 648, 650, and 651) and Agosta-class (S620-623) diesel submarines until the end of the current decade, except for S643 Doris, which is scheduled for decommissioning in 1994.

France has fairly well-developed aircraft carrier forces. In late 1998, the Navy's effective strength is to be supplemented by the first French nuclear-powered aircraft carrier R91 Charles de Gaulle, which will replace the outdated carrier R98 Clemenceau. It is to be launched in April of this year. Construction of a second ship like this is to begin no later than 1996, which will ensure a "reasonable continuity" of shipbuilding work at the shipyards in Brest. It will enter service in the year 2004 and will replace the aircraft carrier R99 Foch, on which flight testing of the Rafale, the latest carrier-based

aircraft, are presently being conducted. In 1995-1996, the carrier Foch will be upgraded to accept the first Rafale combat aircraft in May 1997.

The helicopter carrier R97 Jeanne d'Arc, the only representative of this sub-class of surface ships of the French Navy, is used for training during peacetime. If necessary, it is possible to refit it as an amphibious warfare ship capable of sealifting up to 700 infantrymen. It may be decommissioned no earlier than the year 2005.

Destroyers are represented by the following classes of ships: seven Georges Leygues-class (D641-646), three Tourville-class (D610-612), two Suffren-class (D602 and 603), two Cassard-class (D614 and 615), and one Aconit-class (D609). There are plans to develop jointly with Italy and Great Britain a new ship with a displacement of 6,200 tons.

The most common ships in the French Navy are frigates (patrol ships or corvettes), as a rule, intended for accomplishing the same missions. The effective combat strength includes 17 D'Estienne D'Orves-class (F781-797), three Commandant Riviere-class (F726, 729, and 749), and five Floreal-class (F730-734, Figure 2 [not reproduced]).

Over the next three years there are plans to decommission three D'Estienne D'Orves-class and Commandant Riviere-class frigates.

The Floreal-class F735 Germinale and also three Lafayette-class (F710-712) ships are in various stages of construction, to be commissioned in 1994-1998. In 1992, funds were allocated for construction of three more frigates of the latter class.

Minesweeper forces, numbering 20 ships, are represented by nine Eridan-class (M641-649) minehunters created under the joint French-Belgian-Dutch project Tripartite, five Circe-class (M712-716), two Aggressive-class (M610 and 612), and also four Vulcan-class (M611, 613, 614, and 622), intended for supporting underwater operations. The program for building Narvik-class minesweepers has been terminated.

The Navy's amphibious forces include the following amphibious warfare ships: five Batral-class (L9030-9034), two Ouragan-class (L9021 and 9022), L9077 Bougainville, and L9011 Fudre. It is planned to order two Fudre-class ships in 1994.

In the assessment of command authorities, the French Navy is capable of accomplishing the missions given it with available forces and assets, and a further buildup of its combat potential is envisioned.

At the beginning of this year, Germany's Navy included 96 warships (20 diesel-powered submarines, six destroyers, eight frigates, 41 minesweepers, and 21 small amphibious ships), as well as 38 missile patrol boats. The Navy's personnel strength is about 30,000 people.

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Submarine forces are represented by two Type 205 (S190 and 191), six Type 206 (S170, 176, 192, 193, 198, and 199), and 12 modernized Type 206A submarines (171-175, 177-179, and 194-197). Construction of a series of four Type 212 submarines will begin in 1995. Commissioning of the lead submarine is tentatively set for 1999. The new submarines will replace the Type 205 and 206 boats.

The type of destroyers includes Lütjens-class (three modernized Charles F. Adams-class, D185-187) and Hamburg-class (three D181-183). All were built in the 1960's and will be decommissioned when the new frigates enter service during this decade.

The most modern surface combatants of the German Navy are Bremen-class frigates (F207-214). They were transferred to the Navy in 1982-1990 (Figure 3 [not reproduced]). Four Brandenburg-class frigates (F215-218) are being built and are scheduled to be commissioned in 1994-1996.

Minesweeper ships, the most numerous in the Navy, are represented by 16 Lindau-class (M1070-1083, 1085, and 1087), 10 Frauenlob-class (M2658-2667), 10 Hameln-class (M1090-1099), four Frankenthal-class (M1060, 1061, 1063, and 1066), and also an A1438 Steigerwald mine transport. Construction of six more Frankenthal-class minehunters continues, with commissioning over the next two years.

Missile patrol boats armed with Exocet antishipping missiles are represented by the following classes: Gepard (P6121-6130), Albatros (P6111-6120), and Tiger (P6141, 6143-6151, and 6153-6160). Boats of the latter class are being decommissioned.

Western experts consider the FRG Navy to be one of the leading navies in Europe in composition and structure, level of being equipped with modern weapons and military equipment, and level of professional training of personnel.

Italy's Navy includes 67 warships (10 diesel-powered submarines, a light aircraft carrier, a cruiser, four destroyers, 17 frigates, nine corvettes, 10 patrol ships, 14 minesweepers, and two amphibious warfare ships) and six missile patrol boats. The numerical strength is 49,000 people.

Submarine forces include three classes of ships: Salvatore Pelossi (S522-524), Sauro (S518-521), and Toti (S506 and 513). In 1994, it is planned to commission a fourth Salvatore Pelossi-class submarine (S525); development of a new submarine (Type S90) with a submerged displacement of 2,780 tons has been halted due to budget restraints. Participation in a European project for creating a submarine based on the German Type 212 submarine is being considered as an alternative.

The flagship of the Italian Navy is the light aircraft carrier C551 Giuseppe Garibaldi, commissioned in 1987. Operations by Harrier VTOL aircraft continue to be practiced on the carrier. It is planned to build a second aircraft carrier with a somewhat larger displacement and capable of additionally accomplishing missions of a general-purpose amphibious assault ship, after which the only cruiser in the Navy, C550 Vittorio Veneto, will be withdrawn into the reserve.

In 1993, a second Animoso-class destroyer (D560, 561) entered service in 1993; two more Audace-class (D550, 551) destroyers are in service. The possibility of Italian experts participating jointly with the British and French in developing a new ship of this type is being considered.

Frigates in the Italian Navy include ships of the Maestrale class (F570-577), Lupo class (F564-567), Alpino class (F580, 581), and also the newest Artigliere class (F582, 583). This year, two more of these ships will be transferred to the Navy after construction is completed.

Corvette-type warships are represented by De Cristofaro (F550) and Minerva (F551-558) classes. There are plans to build an additional four Minerva-class corvettes.

The Navy has 10 Cassiopea-class (P401-404), Agave-class (P495-497, 500), and two patrol ships refitted from Aggressive-class minesweepers.

The newest minesweeping ships of the Italian Navy are Lerici-class minehunters (M5550-5558). Five of these ships were transferred to the Navy in just the last two years, and four more will be received in the next two years. In addition, two minehunters of this class have been purchased by Nigeria, four by Malaysia, and 12 by the United States. Five Adjutant-class minesweepers (M5504, 5505, 5509, 5516, 5519) are also in service.

The Navy's amphibious forces have two San Giorgio-class helicopter dock landing ships (L9892, 9893, Figure 4 [not reproduced]). A third ship is to be added to the Navy this year.

The Italian Navy is one of the most modern and combat-effective navies among Mediterranean NATO member-countries in its composition and capabilities.

The status and prospects for development of the navies of the four leading European NATO countries indicate that the cuts being made in the effective strength (by a total of 60-65 ships by the end of the decade) within the framework of the general lessening of military confrontation are being compensated quantitatively and qualitatively by the newest models being commissioned (70-75 ships) under the national programs adopted for improving this branch of the armed services.

(To be continued.)

Footnote

*For beginning of article, see: ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, 1994, No 1, pp 45-50.—Ed.

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